

THE HORN FLY A GREAT PEST TO DAIRY CATTLE

Early and Persistent Efforts Will Succeed in Giving Relief

Considerable anxiety is always evidenced by stock owners, especially dairymen, concerning the sudden annual appearance upon their cattle of enormous numbers of a small blackish fly which irritates the animals so much with its bite and disturbs them so constantly that they fall off rapidly both in flesh and yield of milk. This horn fly is a European pest which was first brought to the notice of the United States division of entomology in September, 1877, and was probably imported with cattle from Europe, where it has been known since 1830. Prof. J. B. Smith of New Jersey worked out its life history and published an account of his work in bulletin 62 of the New Jersey agricultural experiment station, in 1890.

One of our illustrations shows this pest much enlarged in all its different stages of egg, maggot, pupa-case and

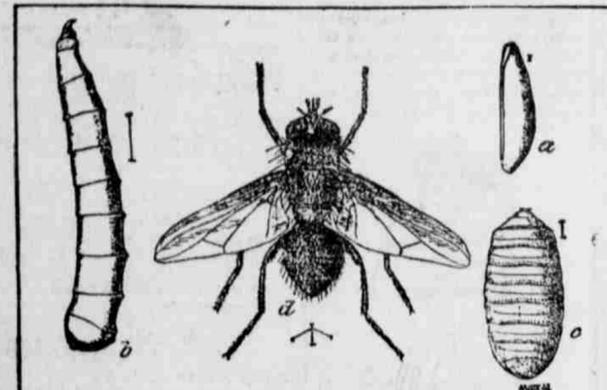


How the Horn Fly Collects on Horn of the Animal.

perfect insect. Our other illustration shows the peculiar habit this insect has of resting in large numbers on the base of the horns, which has given rise to its peculiar name. Both of these figures are after those used by the entomologist of United States in an article in Insect Life, Vol. II., page 93-103, in annual reports for 1889 and 1890.

The appearance of this fly into Canada was first noticed near Oshawa, Ont., in 1902. In all cases since then, when the fly has become general all over America, farmers have come to be thoroughly aroused and to appreciate the losses they suffer by neglecting this pest. Exaggerated statements of losses and injuries to the animals which are quite impossible, have received free and extensive circulation. Cows have been said to have been actually killed by the flies which some allege lay their eggs either on the horns into which the maggots burrow and then penetrate the brain, or in holes which they eat through the hide, lay eggs therein, which hatch out in large numbers and proceed with their boring operations until the vital parts of the cow are touched and death ensues. None of these statements are founded on fact.

The eggs, in the first place, are laid



A CUT SHOWING THE METAMORPHOSIS OF THE HORN FLY. a—EGG. b—LARVA THE FEEDING STAGE. c—PUPA OR COCOON STAGE. d—ADULT.

singly on the freshly dropped dung of cattle, chiefly during the warm hours of the day. They are one-twentieth of an inch in length, brown in color and are not easily seen when laid. The young maggots hatch from the eggs in less than 24 hours and at once burrow a short distance beneath the surface of the dung. Here they remain until full grown, feeding on the liquid portions of the manure. This is their only food, and all stories about their boring into the horns, etc., are untrue. When the maggots are full-grown, which takes about a week, they are three-eighths of an inch in length, shaped as shown in b, and are a dirty white color. They descend a short distance into the ground to pupate, and the dark brown pupa-cases are one-eighth of an inch in length. During the hot weather of summer the pupal state lasts only four or five days, but the last brood passes the winter in this condition a short distance beneath the surface of the ground, and the flies emerge in the spring. The perfect insect (d) male, is shaped much like the common cattle fly (*Stomoxys calcitrans*), or the house fly; but it is smaller, being only one-sixteenth of an inch in length, or about one-third the size of these insects. The head consists almost entirely of the dark-red silvery-edged eyes, but bears on its lower surface the black dagger-shaped tongue which is the cause of so much torture to cattle.

The flies form a more or less complete ring around the horn, extending sometimes from two to four inches from the base of the horn toward the tip as shown.

The clustering on the horns seems to be peculiar to this species. The horn fly does not bite horses and other animals, but seems to confine its at-

tack on cattle. No injury results from this habit of clustering around the horn. The flies merely resort to the horn as a resting place from which they cannot easily be dislodged by the animal. They also congregate on the neck and on the base of the tail.

Some animals are more susceptible to the tortures of this pest than others, according to their temperament and texture of their skins. While feeding, the flies work their way down through the hairs so as to reach the skin of their victim, but they quickly take flight at the slightest disturbance. The bites seem to produce great irritation and sores are frequently formed on the bodies of the animals by their rubbing themselves against trees and other objects or by licking bitten places where the irritation cannot be allayed by rubbing, as inside the thighs and around the udder.

Successive broods follow each other rapidly throughout the summer. Two weeks is about the time required from the laying of the egg to the appearance of the fly, and there is usually time in the summer months for as many as eight generations or broods. This rapidity of development accounts for the flies appearing in such large numbers. The appearance of this insect has been a great curse to cattle owners; so much so that the tormented animals fall off in condition very much and the yield of milk is reduced in some instances from one-third to one-half. There are, however, several simple remedies which will, if attended to, greatly reduce the loss, to say nothing of the hundreds of advertised remedies which are being sold at very moderate prices.

All accounts agree that the fly increases much more rapidly early in the season than later in the year. This shows the advantage of being prepared before the pest appears with the necessary materials and beginning prompt work so as to destroy as many as possible before breeding commences.

Preventive—To quote from the United States entomologists, Messrs. Riley and Howard:

"Almost any greasy substance will keep the flies away for several days. A number of experiments were tried in the field, with the result that train-oil alone and train-oil with a little sulphur or carbolic acid added, will keep the flies away for from five to six days, while with a small proportion of carbolic acid it will have a healing effect upon sores which may have formed. Common axle-grease will answer nearly as well, and the substance has been successful and extensively used by a large stock-dealer in Virginia. Tallow has also been used to good advantage. The practice of smearing the horns with pine or coal

tar simply repels them from these parts. Train oil or fish oil seems to be more lasting in its effects than any other of the substances used."

A cheap and efficacious remedy, suggested by Hoard's Dairyman, and which in the long run will be found to be the best, is kerosene emulsion. The emulsion consists simply of a mixture of soap suds with twice the quantity of ordinary coal oil, made as follows:

Kerosene (coal oil), two quarts; rain water, one quart; soap, two ounces.

Boil the soap in the water till all is dissolved; then while boiling hot, turn it into the kerosene and churn it constantly and forcibly with a syringe or force pump for five minutes, when it will be of a smooth, creamy nature. As it cools it thickens into a jelly-like mass. This gives the stock emulsion which must be diluted before using with nine times its measure, that is 27 quarts of water. It will be found to mix more easily if done at once, before it cools. This makes 30 quarts of the mixture ready for use. This may be applied to the animals, by means of a sponge, or, what is certainly more convenient, a force pump and spray nozzle. One application often lasts two or three days. Where a small number of cattle only are kept, the hand sprayer answers well enough.

Handle Incubator Right.—An incubator often gets a lot of blame that should go to the operator. When a machine is regulated wrong it will go wrong.

Oyster Shell for Ducks.—There should be a trough of cracked oyster shells in the duck yard at all times.

WORK of the SPOILERS

FINEST HARDWOOD FORESTS ON THE CONTINENT RAVISHED.



WASTEFUL METHODS OF LUMBERING



MIXED SECOND GROWTH NATURAL REFORESTATION

The region in Ohio under consideration constitutes a belt through what was at one time probably the finest hardwood forest in the United States. Here grew, in a high degree of perfection, white and red oak, walnut, hickory, maple, elm, beech, locust, sycamore, wild cherry, cottonwood, poplar, Kentucky coffee-tree and chestnut, not to mention several less valuable kinds of trees. The quality of this timber was the very finest throughout the entire belt.

As in every timber country, the first work of the pioneers in this region was to clear sufficient land in the forest to raise the necessary crops. Much of the finest timber was "deadened," or girdled, and when, after two or three seasons it had dried sufficiently, it was felled in great heaps and burned. Only the straightest most perfect sticks of walnut and oak were used in building the log houses and barns. The sterling quality of this timber is manifest in the remarkably well preserved log structures still standing in considerable numbers throughout the region. The roofs of these buildings were made of clapboards, rived with fork and beetle from only the finest sticks of oak, and it was not uncommon for such a roof to last for 40 years or more.

During the first half of the last century there was a large demand for tan-bark to supply the needs of the growing leather industries of Cincinnati and the neighboring towns. To meet this demand, the oak timber was ruthlessly slaughtered over an area of 75 to 100 miles radius. The fine logs, then useless, were piled together and burned. These old-time log-rollings, with their attendant barbecues, were the festival occasions of the frontier communities.

To the early settlers these forests constituted the arch enemy, to be driven back and destroyed by ax and fire. Little did these men think of the value of the forests. To them it meant only a fight for life and success against the forces and conditions of nature. Unfortunately, this instinct for timber destruction, born of necessity among the pioneers, has developed among their descendants into a blind, unreasoning mania. One prominent landowner and stockman of Drake county recently expressed the view that "the country would be better off without a timber tree standing in it!" This is no doubt an extreme case, but there is certainly very little sentiment in the region in favor of forest preservation or renewal. The inevitable result of such an attitude on the part of the people is being reached at a rapid rate. Over most of the region the first-class timber disappeared several years ago, and the second and third class supply is rapidly following.

Immense damage to the timber of this region has resulted from too close pasture of the woodlands. The writer had an opportunity to keep under observation for several years a tract of fine oak timber in which were kept large numbers of hogs. The soil was constantly overturned by the hogs, and many of the smaller roots of the trees were exposed and destroyed. After a few years the trees began to die at the tops, and the owner was obliged to sell the timber for only a fraction of what it would have been worth at the present time if it had been more carefully preserved. Close pasturing by cattle and sheep has proved equally destructive in many cases.

While the general relation of climate to forests is yet a mooted question, it seems fairly well established that, in the region under consideration, local "blizzards" are more frequent and more severe, while the summer winds are more often dry than they were a generation ago. Spring floods and summer droughts, formerly quite unknown, are growing more common. Many of the hills, denuded of their forests and later of their soil, are now quite barren. Throughout the region the growing of fruit orchards is becoming constantly more difficult. This is,

no doubt, due, in part at least, to the increased exposure of the trees to an ever more fickle climate, as well as to the more persistent attacks of tree-infesting insects, which are deprived at once of their natural enemies. For as a consequence of the destruction of the forests the insectivorous birds have been greatly reduced in numbers.

The southern four counties in this range have long been noted for their splendid natural water supply. Along every stream valley the ground-water outcrops at frequent intervals from strata of coarse sand and gravel overlying the limestone. Many of these springs for a hundred years never known to fail, have, since the removal of the back-lying forest, become but "wet-weather springs," absolutely dry in late summer. Over large parts of this area the ground-water level has fallen several feet in the last 20 years, so that wells have had to be dug or drilled to a greater depth to insure a constant water supply. At the same time the problem of drainage is growing more difficult. Small creeks and open ditches, formerly well filled with water the year around, now run almost dry during a good part of the summer, and become choked with a rank growth of weeds which must be removed, else the stream will be completely filled with silt at the next flood season.

As stated before, however, there is but little if any interest shown by the people in the matter of tree planting. It is true that shade-trees are quite commonly planted along the streets of towns and villages, and in public grounds generally, but this practice has not yet extended to the public highway, or even, to any extent, to the rural school-grounds. Most of the counties report a growing interest in Arbor day among the schools, but that interest seems for the most part to be only short-lived and ineffective. The trees most commonly planted for shade and ornament are soft maple, American elm, and Carolina poplar. Fortunately most of the region has gotten over the craze for the unsightly Catalpa bignonioides. Evergreens are but little known, except for cemetery and lawn decoration. Juniperus communis grows native to some extent as an insignificant shrub. No doubt the more useful oaks and walnuts would be more generally planted if the people knew how to handle these less tolerant trees successfully.

In no region is there more urgent need of popular education in matters pertaining to forestry and timber supply. For generations these people have been learning and practicing the art of forest destruction. Before they can be expected to show an active interest in the preservation and renewal of forests, there must be created in their minds a totally new conception of the whole problem. Very few of the land owners give any attention to preserving and making the most of the farm wood-lot. No precautions are taken to prolong the usefulness of fence posts and timber. From sheer necessity, substitutes for wood in house construction are being introduced. Brick, stone and concrete blocks are slowly coming into use for this purpose. Fences, until recently built of rails, are now more commonly made of wire. Yet, the shortage of timber and the consequent inconvenience are growing more apparent every year.

A. B. FLOWMAN, Department of Botany, Beaver College.

Virtue in Tantalum Lamp.—The tantalum lamp is very desirable from the fact that it is of high efficiency, but it is not adapted for many of the fixtures at present in use, for the reason that it must hang vertically, whereas more often than not the lamps in existing fixtures hang at an angle. An adapter has been recently invented by which this discrepancy is overcome.

Between Two Suns

By HARRY STILWELL EDWARDS

Copyright, by Shortstory Pub. Co.

Men in jeans and homespun, singly and by twos and threes, rode into the outer grove. They spoke in whispers and each, as he came into the circle of light from the log fire, dismounted, pressed forward and, touching his hat, took the father's hand.

The burning logs of pine sent upward fitful flames that summoned the house with its doric columns from the shadow behind its magnolias, making flashlight pictures that came and vanished in quiet succession. The aisles among the trees alternated between solemn vistas and a gloom more solemn.

Behind, on the horizon, the lights of a city ten miles away shone like setting stars.

No search of the premises was made—experience had taught these men the futility of search. They waited. That which they waited for came at last, a dog of the "July" breed, obtained from the camp of the county convicts miles away, a dog small, listless, with long drooping ears and awkward limbs. He could pick up a human trail and follow it with unerring skill, faulting never, except when the scent merged perfectly with something familiar. And, even then, if left patiently to work out his problem, he would succeed.

The cotton planter turned to the negroes who, coming to the scene of excitement, stood waiting just outside the circle of light. He spoke gently: "Go, now, boys, to your own homes, and do not move about to-night. I thank you all for coming, and I know that the man we are after doesn't belong here. We don't raise that kind. You—Alec and Uncle Peter and Silas—may remain with me. Your mistress is too ill to be left, and our friends will do all that is necessary."

The negroes dispersed silently, the three named excepted. And then the owner of the dog took the ax which had been found in the house and suffered the animal to sniff at its handle a moment, which he did with increasing interest, and with full comprehension of what was expected of him. He was next taken on to the porch where the entrance had been made, and where he recognized at once a kindred scent. He followed the invisible trail through the window into the room, whisking his tail in growing excitement. He placed his forefeet in the opposite window, looked into the night and down on the ground eight feet below, and whined.

Taking him by the collar, his owner reached outward and downward as far as possible and dropped him. Almost instantly he rushed into the dark-



"Don't Do It, Missy—For God's Sake!"

ness across the flower garden, baying loudly, jumped a fence, passed through the orchard and into a cotton field.

The mounted men in the yard galloped around to a farm gate and the sound of the rushing feet of their horses grew fainter and fainter and died out in the direction of the dog's voice, which was receding straight away.

Thirty minutes later the cavalcade re-entered the grove, the planter advancing to meet them. By a mighty effort, he had up to this moment restrained himself, but at sight of a low, thicket barefoot negro, with of-his-bow bound, and led by a plow line, he lost control. Seizing the ax he rushed upon the wretched man and, but that several spurred their horses across his path while others threw themselves from their saddles and disarmed him, the night's excitement would have ended there.

"Hold, colonel!" said a gray-haired man, who had been acting as leader. "We mustn't make er mistake. Let yo' daughter identify him and we'll tend to the rest. Gentlemen," he continued, turning to the crowd, "it will be embarrassin' for th' young lady to face so many. I think that we oughter draw aside till it's over."

He set the example by riding out of the circle of the light, all following except the two who held the prisoner. Obedient to her father's whispered summons, the girl came from the house and stood by the blazing logs, and as she waited, pale and trembling

on finding herself the focus of so many eyes, the negro was brought forward.

She had seen the face of the robber who entered her room, and whom she had beaten off, in a dim light only, but its every feature was indelibly upon her memory. The sight of that face again stilled her beating heart and calmed every nerve. Her level gaze sought his eyes, but they would not meet it. Once, once only, they rested on her face. No pity, no mercy, was there. It was the face of a judge and an executioner. She had not spoken when shrieks broke the stillness and a negro woman, who had come across the cotton field, plunged into the light and, falling, clasped the girl's knees. The woman was almost breathless with excitement and exhaustion. She had run from the distant cabin where the negro had been seized. He was her boy, and came but seldom to this plantation, and then only to escape the consequences of crime elsewhere.

"Don't do it, missy—for God's sake! It warn't him! No, 'o God, it warn't him! He been dere all night! Say it warn't him, honey—yo' mammy's boy, honey! An' she nussed you an' yourn! Yo' sisters died in my arms! Speak, missy! Tell 'em quick, honey, it warn't mammy's—mammy's boy!"

The girl reached down and rested her hand on the head of the old woman. Her face was white and her voice barely audible.

"Hush, mammy!" She looked intently on the brutal face of the prisoner, who had been brought closer. A shudder shook her form, but she did not turn away her eyes. The words she spoke then were inaudible to any of the group except her father. He started violently.

"Child! Child!" he cried, a look of fear on his face. "Remember what you are doing!"

"What does your daughter say, colonel?" asked the leader.

The planter paused and looked on the girl, whose struggle to be calm was apparent to all. He waited in vain.

"That this is not the man!" he said at length.

The amazement of the crowd was evident, though there was no immediate response. The members drew slowly into little groups. The leader sat his horse, thoughtfully regarding the girl.

"If she's sartin, thar ain't nothin' for us to do but turn him loose and try ag'in. My young fien—are you sartin that this ain't th' man who went into yo' room to-night?" The girl looked appealingly towards him, the negro woman patting her hand and moaning.

"I am certain," she said, and her white face was not turned away. The old man gazed steadily into it and lifted his hat.

Every man in the party read the meaning of his action and every hat was lifted as the woman and girl withdrew.

"Colonel," he said, when they were gone, "under this statement of th' case, we can't do nothin' but turn th' man loose. In a courthouse, if she went thar, as you wouldn't have her, yo' daughter would acquit th' prisoner. Public opinion wouldn't indorse any violence on our part. Boys, untie him!"

The negro was being untied, his hands extended for the purpose, when the man who was working at the knot paused, looking intently at the prisoner's wrist. He called the leader and whispered to him; and as he whispered the negro sought to draw the wrist back under the rough shirt sleeve.

"In th' struggle, colonel," said the leader, coming now to where the father stood thoughtful and depressed, his eyes bent on the flickering fire, "did yo' daughter say anything erbout er wound she made? Try an' remember, please, sah—it may save her comin' back."

"None whatever. The pistol she held was soled and would have been wrenched from her but that in her desperation she succeeded in— Wait! Wait!" he cried, rushing forward. "There must have been a wound! Look for a wound on his wrist!"

The negro's arm was seized and, in spite of a frantic struggle on his part to conceal it, the print of the girl's teeth, where they had sunk into the flesh, became visible. He would have cried out but a hand was laid over his mouth until a gag had been found.

"Stay here, colonel," said the leader as the party mounted and rode away with their prisoner. "We won't need no help!"

The planter remained. He waited until by the fire until Peter extinguished it and then passed slowly to the house.

Through the still open window he saw his daughter on her knees, convulsed with the agony of remorse for her first lie. Her "Mammy," bending over her, was powerless to comfort. The girl was crying.

"Thou knowest my heart! Thou knowest if I have sinned against Thee! Thou—Thou hast said, 'Vengeance is mine—I will repay!'"

The father bowed his head and passed on in silence. As he stood at the end of the porch, mute and oppressed, there came across the fields the faint echo of a volley.

Hay fever differs from a question before the legislature in the fact that the eyes and noses both have it.