

ENTOMOLOGY

Know Your Housefly Enemy

Fly would be gigantic if harmfulness were size. Its supreme ability to fly has helped it become one of our major disease-carrying enemies.

See Front Cover

By DR. FRANK THONE

If flies had physical size in proportion to their harmfulness they would be bigger than rhinoceroses—and a lot more formidable-appearing, too. Seen through the enlarging eye of even a low-power microscope, a fly is a most fearsome-looking object.

A full and detailed description of this dangerous animal would take a book. A quick glance at the principal things about a fly that make it such a menace to man is definitely in order. The more we know about our enemy the more effectively we can fight him.

One of Best Fliers

To begin with, the fly gets its very name because of its supreme ability to do just that: fly. The common fly is one of the most efficient flying-machines in the world, far superior to birds and bats. The few insects that surpass it in the air are members of the same insect order—other species of flies. Compared with a fly, man's most agile airplane seems clumsy. A plane can turn itself upside down, to be sure, and even cruise along that way for considerable distances; but what plane can land upside down on the ceiling and stick there? Yet a fly knows how to do that without teaching, as soon as it gets the use of its wings. As for quickness in takeoff, and ducking and dodging around in the air, no one who has ever swung a fly-swatter needs to be told about these.

Entomologists list the fly in the order known as the Diptera, or two-winged insects. Members of that order have only one pair of wings, as contrasted with the two pairs possessed by most other insects. Where the second pair presumably used to be, in earlier evolutionary days, there is now a pair of short-stalked projecting knobs commonly called balancers. That seems to be their function: at any rate, if one of these knobs is clipped off the fly becomes unable to guide itself in the air, swerving crazily in circles. But so long as its normal apparatus is not interfered with,

there's nothing can fly better than a fly.

The fly's landing gear—its six legs—presents a more intricate appearance than its wings, though like all efficient flying-machines it uses them but little in getting about. It doesn't even need to taxi down to the end of a strip for a takeoff run. It just squats down a little, hops up, and is off. It is like a helicopter in that respect, though more like a fighter plane in speed and maneuverability.

Each of the fly's six feet is equipped with two little pads underneath. These have pores through which a sticky fluid oozes out. This is what enables flies to walk on the slipperiest surfaces, even when they are vertical or upside down. Legs and feet of the fly are also covered with an array of fine bristles. These serve as additional catchers for the filth in which the fly delights to wade—and then proceeds to walk around over your food, or the baby's nursing-bottle.

The fly often grooms itself by rubbing its legs together, and licking them with its tongue, cat-fashion. That may clean its feet, but the germ-swarming stuff goes into its stomach, and is either regurgitated when the nasty little in-

sect decides to make a meal off your sugar, or is dropped as a flyspeck almost anywhere. As an unconscious agent of bacterial warfare against mankind, the fly can hardly be improved upon.

What is commonly called the fly's tongue has little resemblance to the tongue as we know it in larger animals. It consists of several distinct parts, set together to form a tube. It is through this that the fly regurgitates liquid from its stomach to dissolve its food, and then sucks it back up again. Very satisfactory for the fly, but not so good for us.

Housefly Can't Bite

Having to get its food entirely by liquefying it and then sipping it up as through a soda straw, the ordinary housefly cannot bite. Many persons, who have been most outrageously bitten by flies, especially just before a thunderstorm, will dispute this statement. But the flies that bite them are of other species that look more or less like the housefly, notably the stable-fly and the horn-fly, which normally live around animals from which they can get the blood that is their usual food. When they sense a storm coming on, however, they are very apt to attempt the riskier venture of trying to fill up on human blood.

The only other notable features of a fly's head—indeed, covering the greater part of it—are its many-faceted compound eyes, that cover the greater part of its head. Under a strong magnifying glass, their surface appears divided up into hexagons, like a honeycomb. This division holds throughout their structure; each eye is made up of hundreds of these six-sided prisms, tapering to narrow points at their inner ends where the sight-nerves are inserted, each with its individual lens at the outer end.

What the fly sees through these eyes is not certain; one would have to be a fly oneself really to know about that. However, it is probable that the fly's-eye view of the world is more or less of a mosaic pattern, rather than a smoothly continuous one such as seen by the eyes of the higher vertebrates, including ourselves.

What is more important, especially from the fly-fighting angle, is the tremendous field of vision, very much wider than our own. A fly can see what is going on in front, on both sides, and to



FIGHTING FLIES—This aerosol bomb is effective against flies.

some extent even behind, so it is able to spot danger approaching from almost any point. It interprets any movement of any object in its neighborhood as hostile, and takes off immediately.

This very wide field of vision is what makes flies have such a preference for roosting on the ceiling, on projecting wall and door-jamb edges, and especially on hanging strings and wires. From such vantage-points it can see in all direc-

tions. Also, it has a choice of flight in all directions if anything threatens it.

Knowing this tactical choice of the fly enables us to put DDT on just the places where the fly is most likely to settle.

Science News Letter, June 21, 1947

MEDICINE

Blood and Plasma To Be Available to All Soon

➤ BLOOD AND PLASMA which saved the lives of thousands of American fighting men in World War II may be available to all Americans anywhere in the country without charge within three to five years.

Chairman Basil O'Connor of the American Red Cross announced the National Blood Program at the opening of the Red Cross convention in Cleveland.

Explaining how modern medicine and surgery use blood in the treatment and prevention of disease as well as in the front lines of war, Chairman O'Connor said his group's program has the support of medical and health leaders.

The Red Cross will continue its wartime work in collecting blood donations. Within three to five years, the program could make blood and plasma available throughout the country, Mr. O'Connor predicted.

Science News Letter, June 21, 1947

AERONAUTICS

Two Small Planes Used To Make One Big One

➤ MAKING a big plane out of two small ones, plus a stub-winged glider, is the interesting invention of a former member of the Air Transport Command, O. A. Buettner of Pittsburgh, on which U. S. patent 2,421,742 has been granted. Rights are assigned royalty-free to the government.

Recesses are sunk into the upper surfaces of the glider's truncated wings. One wing of each of two fighter planes is latched into these recesses, linking all three together as one large craft. The glider can be used for transporting troops or supplies, or it can be made into a huge fuel reservoir, enabling fighters to accompany bombers on long raids, so that they can go into action with their own tanks full after jettisoning the emptied glider.

Science News Letter, June 21, 1947

CARTOGRAPHY

Map Measuring Distances And Areas in Terms of U. S.

➤ HOW FAR is it from Omsk to Tomsk? Are the Urals longer or shorter than the Alleghenies? How big is Baluchistan? Questions like these can be answered in terms of U. S. A. distances and areas by means of a new globe on which Homer V. Johannsen of Chicago has received patent 2,422,101. Along with the globe, mounted on a curved rod, is a map of the United States on the same scale and degree of curvature. It can be superposed on any part of the globe for comparison purposes.

Science News Letter, June 21, 1947

MEDICINE

Multiple Sclerosis Produced in Monkeys

➤ PATIENTS suffering from the "brutal" and always fatal disease, multiple sclerosis, are getting an answer to their plea, "Why doesn't someone do something about this disease?"

Someone has done something. Dr. Elvin A. Kabat and associates at Columbia University and the Neurological Institute in New York have found a way to produce the disease in monkeys and a clue to the cause of the disorder.

To help them push their research further, with the ultimate aim of finding a cure or preventive or both, the Association for Advancement of Research on Multiple Sclerosis has just made its first grant of \$64,350.

The Columbia doctors found they could produce the disease in monkeys by injecting a bit of the animal's own brain tissue into their bodies. This has led to the theory that in human patients accidents or germ diseases might cause a tiny bit of the brain tissue to be dislodged and start travelling through the body in the blood stream.

When this happens, if it happens, the body would react to it as it does to any foreign protein substance. Familiar examples of reaction to minute amounts of foreign protein are the allergies such as hives, hayfever and migraine headaches. Multiple sclerosis is believed, on the basis of the monkey experiments, to be the result of such a reaction, which doctors term the antibody-antigen reaction.

Science News Letter, June 21, 1947

HOW TO GET RID OF FLIES

DDT, best present weapon against flies, can be used to advantage in two different ways, for ordinary indoor applications:

Use the handy aerosol mist bomb, which contains pyrethrum as well as DDT, for quick knockdown and sure kill of flies in a room. Shut windows and doors, open the discharge valve, and swish the spray around for a few seconds. Then leave the room and keep the door shut for about half an hour.

Use a 5% solution of DDT in odorless kerosene to spray on ceilings, upper parts of walls, and other roosting-places of flies. Brush it on screen doors and window screens, frames and all. This leaves an invisibly fine deposit of DDT crystals, which clings to flies' feet when they walk on it. In an hour or less they become paralyzed and die.

You can buy this 5% spray ready mixed, or you get a concentrated solution of DDT in xylene, for dilution to 5% on your own workbench. When using these sprays, be careful to extinguish all open lights and fires beforehand, and above all, don't smoke. Mists and vapors of kerosene are inflammable.

Spray the outside of the house around doors and other openings where flies try to get in. Spray the dog kennel, chicken house and any other outbuildings where flies gather. These residual sprays remain capable of killing flies for as much as five or six months after application.