the under side almost completely covered with the larvae. As
a consequence, two or three of the yearly broods attack the gar-
denia which is often almost completely defoliated. Since the
gardenia is liable to be attacked by any one of the three main
broods it will often be necessary to spray the plant three times
a year. Since the gardenia leaf is decidedly more tender than
the citrus, the gardener should confine his sprays to the more
highly refined oil emulsions, which usually means the "white"
oil emulsion. The adult whiteflies are easily killed by dusting
with sulfur but since the sulfur would be active for only a few
days, in order that one may effectively control the whitefly by
killing off the adults it would be necessary to make several
applications for each brood.

—J. R. WATSON

DRAGONFLIES PREDACEOUS ON THE STABLEFLY

_Stomoxys calcitrans_ (L.)

MIKE WRIGHT

(Continued from Vol. XXVIII, p. 13)

The fact that these dragonflies actually fed upon dog flies was
verified in the following manner: (1) A number of odonates,
especially _Anax junius_, were caught and identifiable remnants
of dog flies were found clasped in their mouth parts; (2) dragon-
flies were observed to catch dog flies which were swarming
about livestock; and (3) on several occasions dog flies that had
previously been feeding on the observer were seized by dragon-
flies as they flew away. Large numbers of dog flies were taken
while swarming in open areas and while perched on walls of
barns, houses, etc. In the open the dragonflies were observed
darting about at a height of 1 to 8 or 10 feet in search of prey.
These swarms contained hundreds of odonates and they were
constantly observed to seize their prey and dart away. Dog
flies commonly congregate about houses and especially barns
housing livestock, where they spend a good part of the time
perched on the walls. Many dragonflies were observed flying
up and down the walls and capturing perched dog flies. In the
majority of the cases noted the fly was eaten by the predator
during flight, but a number of dragonflies were noted to perch be-
fore feeding. During the periods of high dog fly population along
the beaches relatively few individuals of other species of insects
were encountered. In some localities a number of houseflies were noted, but these were present constantly and were not sufficiently numerous or attractive to hold the swarms of dragonflies after the dog flies were moved inland by a southerly breeze. Thus, the fact that but few other species were present in the dog fly swarms and that the swarms of dragonflies were continually feeding on the flies indicates the large numbers of dog flies destroyed.

It is impossible to convey to one who has not seen these dragonfly swarms a conception of the tremendous numbers of dragonfly individuals present therein. A few examples will be given here in an attempt to picture the populations. On September 10, 1943, large numbers of Anax junius were swarming along the beach and the highway, which approximates the beach, just east of Fort Walton, Fla. While the writer was driving along the highway from a point 16 miles east to Fort Walton, he collected about 20 specimens of A. junius on the radiator and windshield wiper, while many more hit the front and sides of the car and fell on the highway. Upon reaching Fort Walton it was found that about a dozen dragonflies had entered the opened windshield and were dead or in a dazed state in the back of the car. While standing on the highway or on the beach the air appeared to be literally filled with dragonflies darting about in search of prey. When one realizes that such swarms occur at times from near Pensacola to beyond Panama City, Fla. (over 100 miles), some idea of the uncountable numbers can be made. It might appear that so many dragonflies would soon exterminate the dog flies. They undoubtedly kill countless numbers, but even as numerous as the dragonflies are, the dog flies are many times more so. In addition, the flies, when no control is carried on, produce new broods approximately every 3 weeks, while the dragonflies take at least three months for their nympha! existence.

LITERATURE CITED

Dove, W. E., and Simmons, S. W. 1942. Control of stablefly, or "dog fly" breeding in shore deposits of bay grass. Jour Econ. Ent. 35: 582-589, illus.