

INSECTS INVADE AN URBAN POOL

by E. A. DRIVER*

Most of us are familiar with the dramatic migrations of the Monarch Butterfly (*Danaus plexippus*) from British Columbia to southern California or the Desert Locust (*Schistocerca gregaria*) which migrates for thousands of miles in the Middle East during the dry seasons. Closer to home, many poorly known aquatic as well as terrestrial insects move from one habitat to another for a variety of reasons. These movements may be as short as several hundred feet or as long as 50 miles. Unfortunately, few migrations are observed. Many insects are not noticed because they are drab or dark coloured or small and so we may fail to appreciate this phenomenon.

Many aquatic insects can travel against the wind while others are transported on strong winds. Wind influences the direction of travel but the duration of flight (migration) is controlled by the insect.

Aphids, mosquitoes, butterflies and other insects begin to migrate soon after they emerge from the nymph or pupa stage. Many will fly en masse from the emergence site to a new breeding area. Some fertilized female mayflies (*Hexagenia bilinuta*) migrate 12 miles from river to lake¹. Aquatic insects are forced to migrate as ponds dry up.

There are several kinds of migration: migration away from the place of birth without return or migration to hibernation sites and return to similar breeding habitat (also see Johnson²). Aquatic insects par-

ticipate in both types of migration.

Many dragon- and damselflies begin migration immediately after emergence from the water. Whiteface dragonflies (*Leucorrhinia*) and the large Blue Darners (*Aeschna*) pursue an outward migration after the teneral stage (the teneral stage of an insect is the period immediately after the insect moults or emerges) and do not return to their natal site.

Several species of butterflies and mosquitoes display the second type of migration, for example, the Monarch Butterfly and a mosquito (*Anopheles earlei*). This anopheline mosquito emerges from roadside ponds, flies several miles to overwinter in ground squirrel burrows and in spring finds a temporary pond to lay her eggs in.

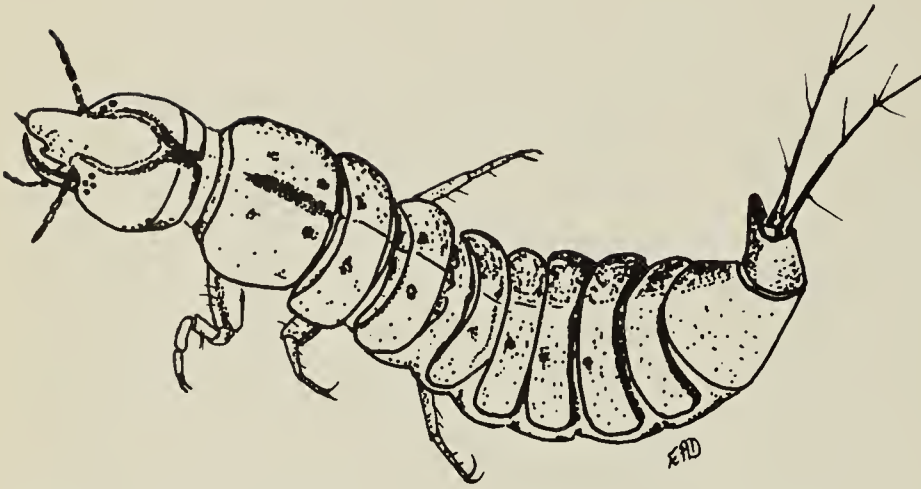
The following is an example of local insect migration in Saskatoon.

Our neighbor's unused swimming pool is bordered by Cut Leaf Weeping Birch (*Betula pendula gracilis*), Manchurian Elm (*Ulmus pumila*) and a large bed of Hansa Roses (*Rosa rugosa* hybrid). Leaves from these trees and shrubs combined with dust in the pool provided an excellent habitat for larval stages of aquatic insects. The litter varied from less than 6.3 mm (1/4 inch) to 31.7 mm (1 1/4 inches) in depth. Water in the pool was maintained at a maximum depth of 122 cm (4 feet).

In the fall of 1972 several species of predaceous diving beetles (Dytiscidae) were noted in the pool. In August, 1973, after the pool had stood undisturbed for 4 months, I observed a large number of midge (Chironomidae) pupa exuvia (the

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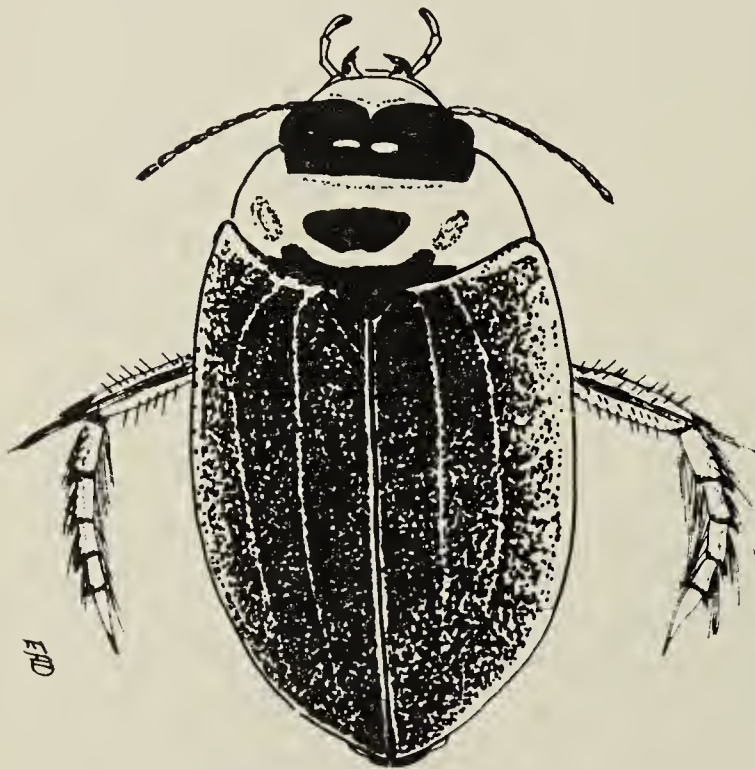
FIGURES



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Figure 1. Predaceous diving beetle larva, *Hydroporus* sp., length 5 mm

Figure 2. Caddisfly larva, *Phryganea cinerea*, case constructed from leaves and grass clippings, length 10 mm

Figure 3. Predaceous diving beetle, *Rhantus notatus*, length 8 mm

Figure 4. Pupa exuvia of the midge, *Phytotendipes barbipes*, length 6 mm



Figure 5. Head and thorax of an adult male water strider, *Gerris dissortis*, length 12 mm



Figure 6. Ventral view of an adult backswimmer, *Notonecta undulata*, length 12 mm



Figure 7. Frontal view of a predaceous diving beetle, *Rhantus notatus*, length 8 mm

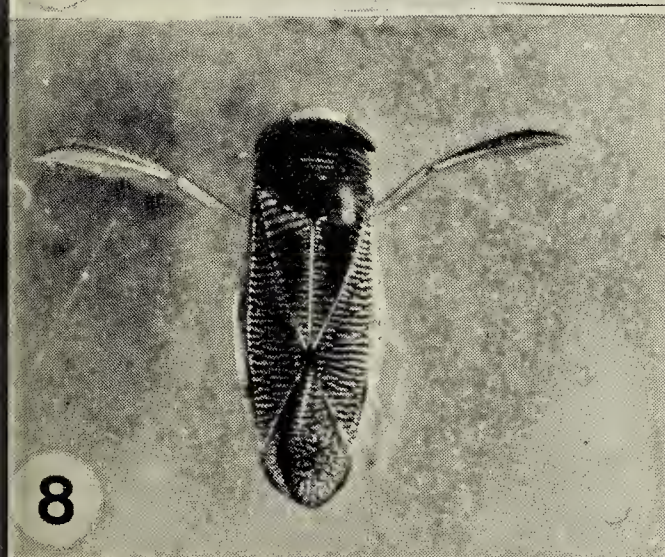


Figure 8. Female water boatman, *Callicorixa audeni*, length 6 mm

outer layer of skin of the pupa) floating at the surface of the pool. At this point I sampled the pool using a sweep net to determine how many species of invertebrates were present.

The pool was inhabited by dragon- and damselflies (Odonata), bugs (Hemiptera), beetles (Coleoptera), caddisflies (Trichoptera), mayflies (Ephemeroptera), flies and midges (Diptera), bees (Hymenoptera) and aphids (Homoptera). Twenty-eight of the 33 species collected (Table 1) are common in prairie potholes or sloughs and some are capable of coping with flowing water, for example, the mayfly (*Ephemera*) and the dragonfly (*Aeschna i. interrupta*).

The swimming pool is located 0.32 km (0.2 miles) northwest of the South Saskatchewan River, 0.48 km (0.3 miles) southeast of a temporary pond, 1.92 km (1.2 miles) southeast of a semipermanent pond, and 2.24 km (1.4 miles) east of Hudson Bay Marsh at the Saskatoon Airport. Many of the aquatic insects, therefore, emerged within easy migrating distance of the swimming pool. These insects, along with the bees and aphids, were likely attracted by the reflection of the water surface. The water striders, waterboatmen, beetles, caddisflies, mayflies (*Callibaetis*), midges and phantom midges migrated in early summer and produced at least one generation in the pool.

Table 1. Insects collected from a swimming pool in Saskatoon, Saskatchewan.

<i>Species</i>	<i>Life stages</i>
Dragon- and damsel-flies (Odonata)	
<i>Aeschna i. interrupta</i>	Adult female drowned
<i>Lestes disjunctus</i>	Adult female attempting to deposit eggs on side of pool
Water striders (Hemiptera)	
<i>Gerris dissortis</i>	Adult male standing on water
<i>Gerris buenoi</i>	Adult female and nymphs skating on water
Backswimmer (Hemiptera)	
<i>Notonecta undulata</i>	Adult male swimming
Water Boatmen (Hemiptera)	
<i>Corisella taralis</i>	Adult female feeding on algae on side of pool
<i>Trichocorixa</i> sp.	Adult female swimming
<i>Callicorixa audeni</i>	Adult female and nymphs swimming
Water scavenger beetles (Coleoptera)	
<i>Tropisternius lateralis numbatus</i>	Adult male swimming
Whirligig beetles (Coleoptera)	
<i>Gyrinus maculiventris</i>	Adult swimming on water surface
Predaceous diving beetles (Coleoptera)	
<i>Rhantus notatus</i>	Adult female swimming
<i>Agabus bifarius</i>	Adult female swimming
<i>Hydroporus</i> sp.	Nymph swimming
<i>Helophorus oblongus</i>	Adult swimming
<i>Helophorus</i> sp.	Adult swimming
<i>Hygrotus patruelis</i>	Adult swimming
<i>Hydrovatus</i> sp.	Adult swimming
Caddisflies (Trichoptera)	
<i>Phryganea cinerea</i>	Larva crawling on litter at bottom of pool
Mayflies (Ephemeroptera)	
<i>Callibaetis</i> group	Adult female and nymph exuvia at water surface, nymphs swimming
<i>Ephemerella</i>	Adult female on water
Midges (Diptera; Chironomidae)	
<i>Phytotendipes barbipes</i>	Pupa exuvia floating on water, larva crawling in litter at bottom of pool
<i>Tanytarsus</i> sp.	Adult female and pupa exuvia on water
<i>Psectrotanypus guttularis</i>	Larva feeding in litter and pupa exuvia floating on water
<i>Psectrocladius barbimanus</i>	Adult male partially emerged from pupa exuvia at water surface

<i>Acricotopus nitidellus</i>	Adult male and pupa exuvia at water surface
<i>Cricoptus</i> sp.	Adult male and female and pupa exuvia
<i>Corynoneura</i> sp.	Larva living in litter at bottom of pool

Phantom midge (Diptera; Chaoboridae)

<i>Chaoborus americanus</i>	Larvae swimming
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Bees (Hymenoptera)

<i>Bombus</i> sp. (bumble bee)	Adult drowned
<i>Apis mellifera</i> (honey bee)	Adult wet on water surface

Aphids (Homoptera)

<i>Rhopalosiphum maidis</i> (Corn Leaf Aphid)	Adult males sitting on water
<i>Macrosiphum dirhodum</i> (Rose Grass Aphid)	Adult males sitting on water
<i>Macrosiphum avenae</i> (English Grain Aphid)	Adult males sitting on water

Two interesting facts were gleaned from the swimming pool. First, a moderately barren habitat, lacking rooted aquatic plants, was able to support a diverse aquatic insect community and, secondly, this community was more complex than those I have studied in some natural wetlands. Ponds that hold water for 4 to 15 weeks near Floral, Saskatchewan, had an average of 10 species of aquatic insects with a range of 5 to 24 species per pond. The total for 10 temporary ponds was 28 species. (These totals may be low because species could have been missed during sampling.) More permanent ponds in the same area support aquatic insect communities in excess of 70 species.

A HOME PROJECT

Anyone can place a tub or pail filled with water in the backyard, visit the "pool" weekly and record the number and kinds of insects. A dugout or pond serves the same purpose. Collecting and preserving one or more of each kind of insect you find may be the best

way to keep track of how many kinds appear in your "pool". A seive or dip net is as good as anything for collecting. Preserving insects is more complicated. You may wish to use one vial for each kind of insect or put them all in one or more larger bottles. Rubbing alcohol or formaldehyde, available from either a drugstore or hardware, will keep your collection in life-like condition for years.

To check the direction of migration, an old storm window can be set up on each side of a dugout. A small tray filled with a soap solution at the base of each side of a window will catch insects which strike it and give an indication of what direction they are moving.

To identify many of the insects, "*A field guide to the insects*" by D. J. Borror and R. E. White (1970), part of the Peterson Field Guide Series, is very useful. Other books can be obtained through a local library.

I wish to thank Ulrich Hochwald for

photographing the insects and Maurice Taylor, Canada Department of Agriculture, Saskatoon, for identifying the aphids.

¹BURKS, B. D. 1953. *The mayflies or Ephemeroptera of Illinois*. Natural History Survey, Urbana, Illinois. 216 pp.

²JOHNSON, C. G. 1969. *Migration and dispersal of insects by flight*. Methuen and Company, Ltd., London. 763 pp.

Students wishing a copy of this paper may obtain it by writing the author.

A WHITE-BANDED DAY SPHINX MOTH — NEW TO MANITOBA

by WALTER V. KRIVDA*

In sorting and arranging a twenty five year collection of Sphinx moths in the writer's collection at The Pas various new records for the province are being discovered.

The present, apparently unique specimen for Manitoba was collected in the southeastern part of the province at Brokenhead, Manitoba June 6, 1954, Dan Mosquin, collector. It is somewhat worn showing distant migration. The specimen is somewhat on the small side and likely is of the first generation.

The White-banded Day Sphinx Moth is common in southern Florida and native throughout South America. Previous migrant records are known as far north as Massachusetts, New York, Michigan and Missouri, but this is the first record for Manitoba.

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White-banded Day Sphinx Moth.

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