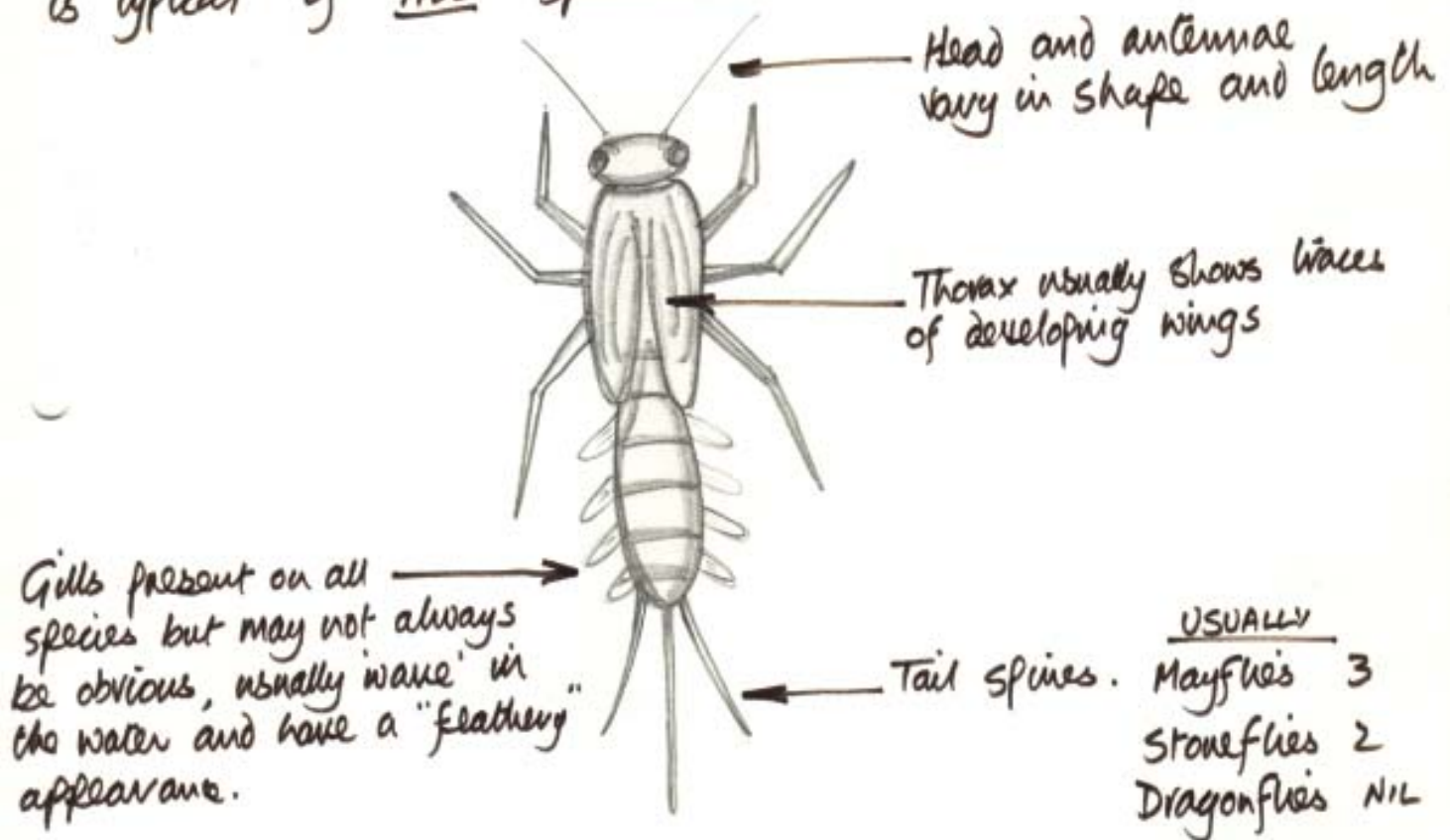


Dragonfly, Stonefly and Mayfly nymphs.

All of these have similar habitats and feeding habits, they may vary in size and shape but the following is typical of ALL species:-



Most species are bottom crawlers or on stones and plant stems, some are plant eaters but others are carnivores especially dragonfly nymphs which seize their prey in specially adapted jaws.

Normal locomotion is slow in the extreme, almost as if nymph moves in slow motion, but movements very deliberate. Dragonfly nymphs sometimes run a few steps to catch prey, but prefer to approach an unwary victim slowly.

Nymphs spend period of up to 3 years in the aquatic state growing and feeding, but when ready to hatch will select stem of aquatic plant

f-10

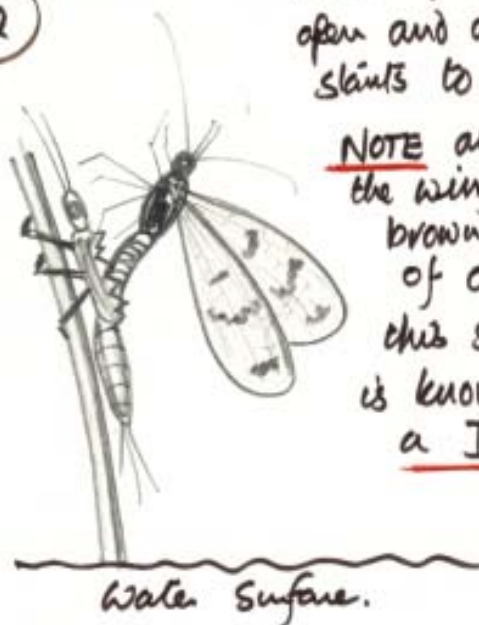
usually near reed beds or on stalks of semi submerged grasses, and crawl up these out of the water. The adult insect then emerges thus:-

TYPICAL MAYFLY

①



②



Back of nymph splits open and adult mayfly starts to emerge.

NOTE at this stage the wings are dull brown and incapable of operating, at this stage the fly is known as a DUN

- ③ Dun will cling to plant stem until its wings harden and clear, it will then fly away as an adult mayfly. Note. Some species moult at this stage. During the first few minutes the new adult's flight is erratic and it may fall fluttering into the water.

Typical colour of nymphs is dull grey/khaki.

Midge Larvae (Chironomus)

This is the larvae of the Common biting midge

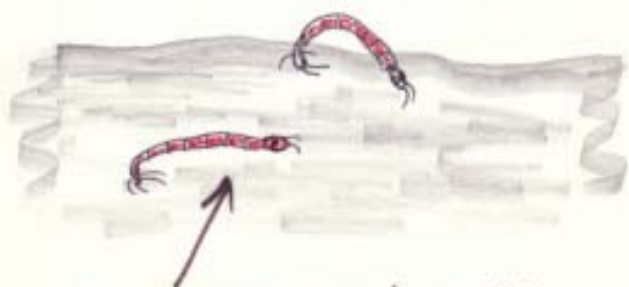
They are sometimes referred to as 'bloodworms' due to the characteristic presence of Haemoglobin in their tissues, it makes them look like animated sacks of blood.

They are bottom dwellers crawling sluggishly through silt and occasionally sand so long as it contains sufficient detritus to allow them to feed.

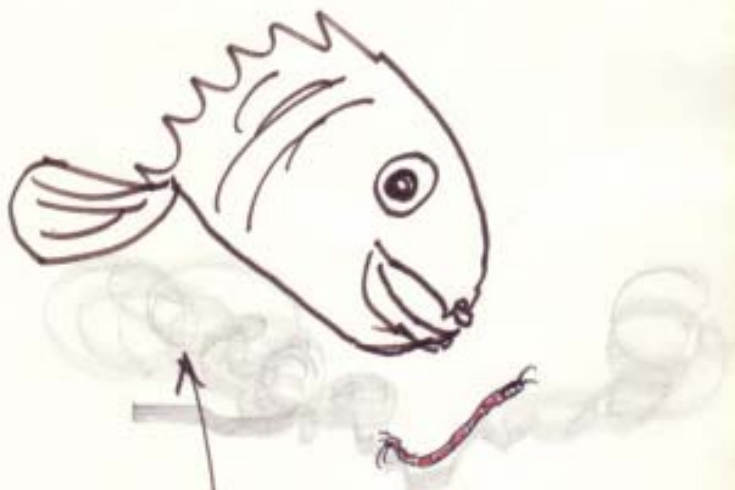
They are found in deeper water than other midge larvae.

Their presence in soft mud may be revealed if they come to the surface or if the mud is swept aside by a passing fish:

APPROX.
ACTUAL SIZE



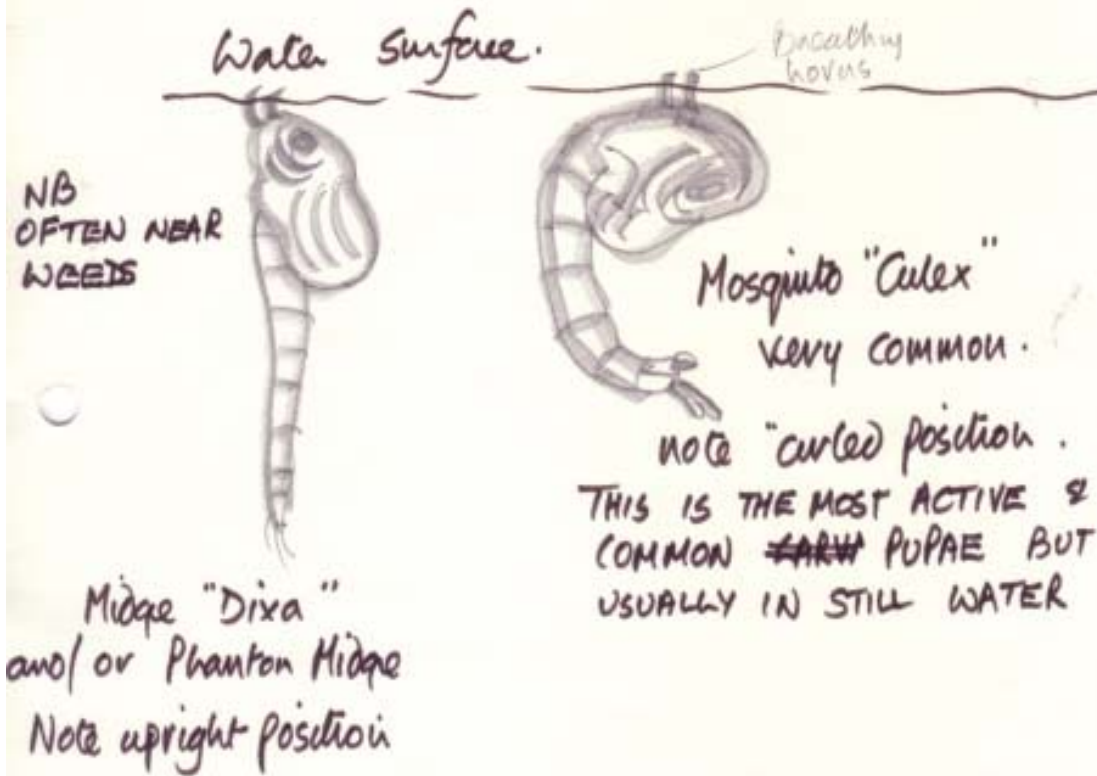
larvae actual size living in soft bottom silt, occasionally breaking surface in search for food



Mud surface disturbed by fins of hunting fish exposing larvae.

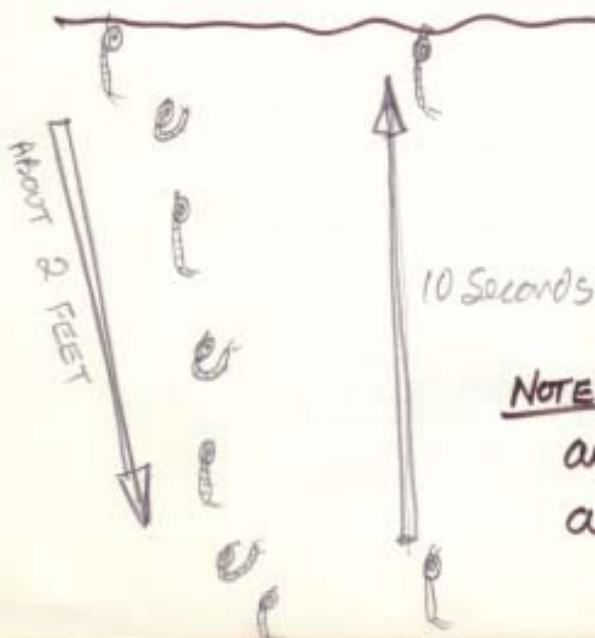
Fly (Midge) Pupae.

These vary in habit but basically follow the same behaviour pattern, species vary mainly in surface "attitude" thus :-



Other species are less common but will exhibit degrees of 'curling' between these two extremes.

When disturbed they descend rapidly using the same 'jerky' movements as their larvae thus :-



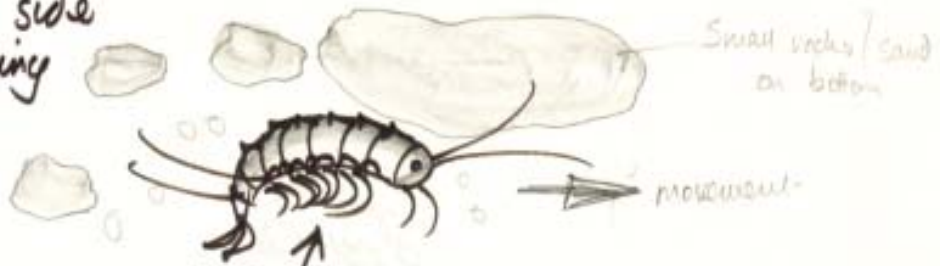
NOTE Pupae is always still as it ascends and exhibits the same position as it adopts at the surface.

Freshwater Shrimp (Gammarus) (see also water louse)

Tends to be a transparent orange/pink colour rather than white.

Never still, always some movement of legs:

appears to lie on its side when feeding or resting

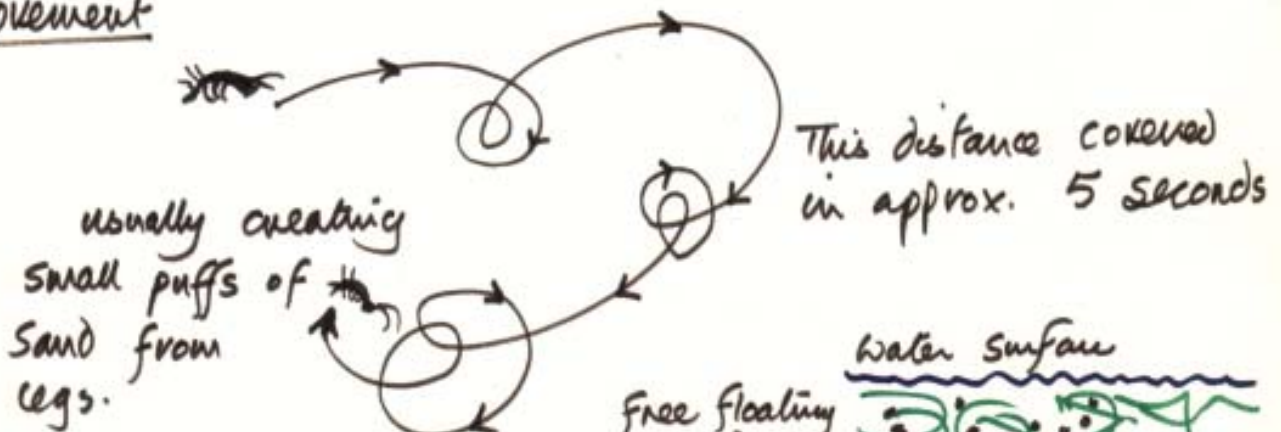


Sand laid on current moulds

These are in constant movement - feeding water over gills even when animal is resting

Animals move in rapid scurrying circular movements usually on sandy/pebbly bottoms in clear shallow water, or inhabit masses of floating pond weed:

Movement



NOTE If the water is sufficiently shallow i.e. $< 4'$ deep. Shrimps can swim upwards and regain the weed. They swim rapidly, right side up (as if running through the water) taking about 10 s. for the trip.

Shrimps constantly fall out of weed and scurry along bottom looking for shelter.

Segmented Freshwater Worms

These are almost invariably bottom dwellers, tending to live in soft mud in fairly deep water, i.e. away from the edges of the pool.

They burrow in the mud searching for organic matter for food (see Nidge larvae Chironomus) occasional breaking surface.

NOTE no common species of segmented freshwater worm is over $\frac{3}{4}$ " long.

TYPES

Water Surface.

Floating weed.



← Eiseniella falling out of weeds.

Tubifex worms.
Red in colour, live in tubes with tails protruding
NB. WILL RETRACT TAIL AT SLIGHTEST WATER TURBULENCE OR VIBRATION

B



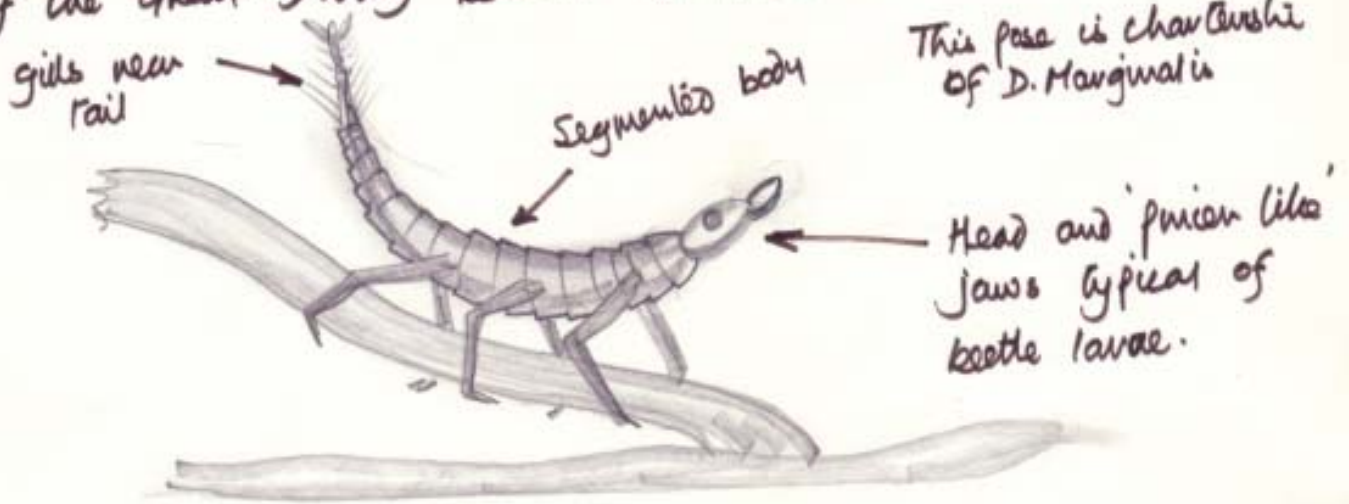
many species of worms live in the bottom mud.
Colours range from transparent → Blood Red.

Water Beetle Larvae

These may at first glance be confused with Dragonfly (Stonefly) nymphs but are usually distinguished by their larger size, absence of thorax (through segmented body) and their speed of movement.

The ~~more~~ more common larvae are fiercely carnivorous, the larger ones attacking full grown tadpoles or small newts.

A typical larvae (although one of the largest) is the larva of the Great Diving Beetle *DYTISCUS MARGINALIS*. X2.



Beetle larvae are much more active than fly larvae and move with quick scuttling bursts interspersed with longer periods in a motionless pose.

Colours vary from pale buff, through brown to dark grey, although they tend to be lighter than fly larvae, this will vary from pool to pool.

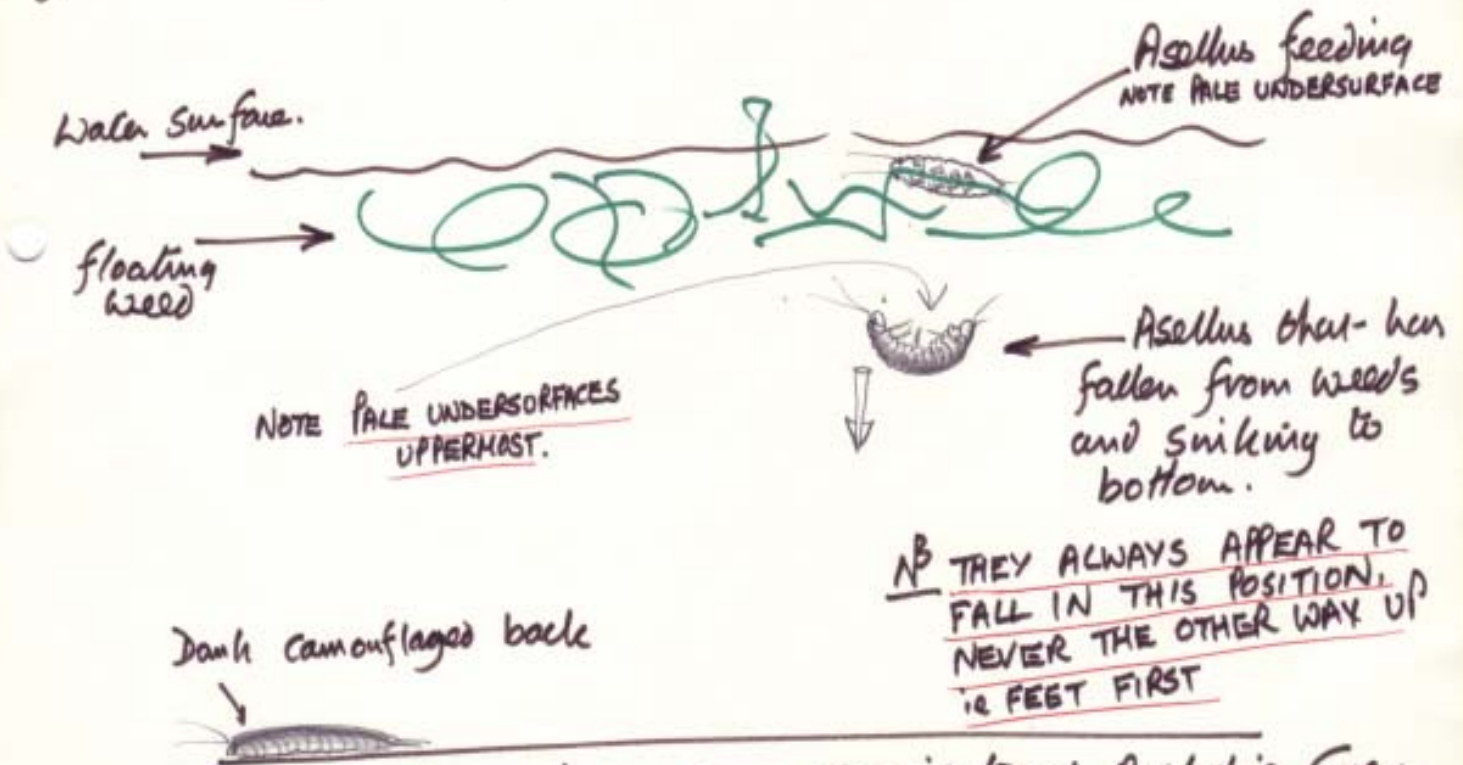
The Water Louse (Asellus) (see also freshwater shrimp)

Very common in ponds. may be useful food source for bottom feeding fish. Habits and habitat similar to that of the freshwater shrimp (Gammarus)

If on bottom of pool, animal will crawl slowly ~~over~~ over bottom looking for plant debris to eat.

It is useful to remember that this animal is a close, although slightly more sluggish relative of the terrestrial wood louse, and when on the bottom behaves in a similar manner.

Fish make take Asellus from the bottom, or as in the case of the freshwater shrimp, take them as they fall out of clumps of floating weed:-



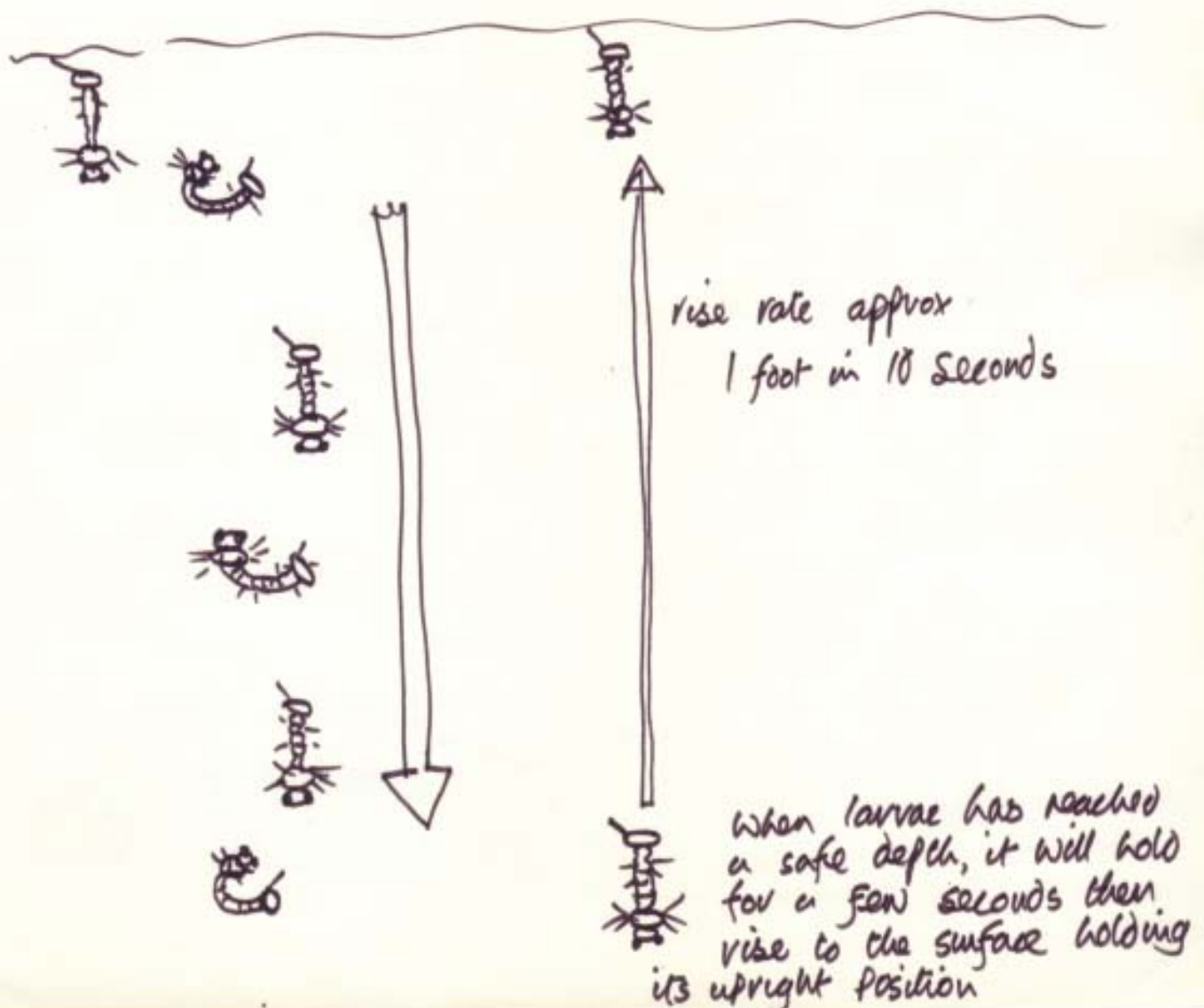
NOTE The back of the animal appears Greenish/Dark Battleship Grey, its undersides are dove grey/cream, and it may be this 'flash' of colour that attracts fish when the animal falls from the weeds

Gnat Larvae (Culex)

Tend to spend periods of several minutes at the surface, (always in the characteristic "hanging" position typical of species) thus :-



When disturbed, Culex will swim to the bottom, or to what it considers a safe depth — usually 2 feet or so in a series of CHARACTERISTIC JERKY MOVEMENTS thus

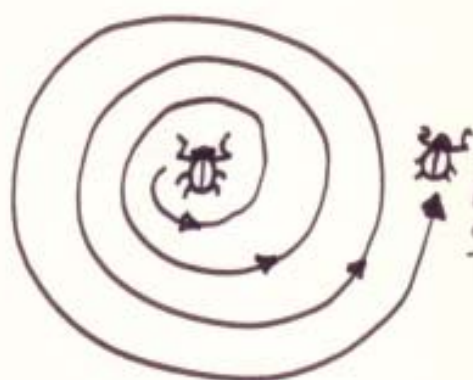


Surface dwelling Beetles

The Whirligig beetle (*Gyrinus*)

This beetle is easily distinguished by its gyrations on the surface of the water.

This cannot be confused with the pond skater since the gyrations are always concentric and create ripples, thus:-



Typical movement.
over 15 secs.

On still water, from a distance of, say 20' the ripples that this beetle produces can be seen spreading from the source, thus distinguishing it from the pond skater which does not create ripples

Gyrinus x 3



← Highly developed front swimming legs.

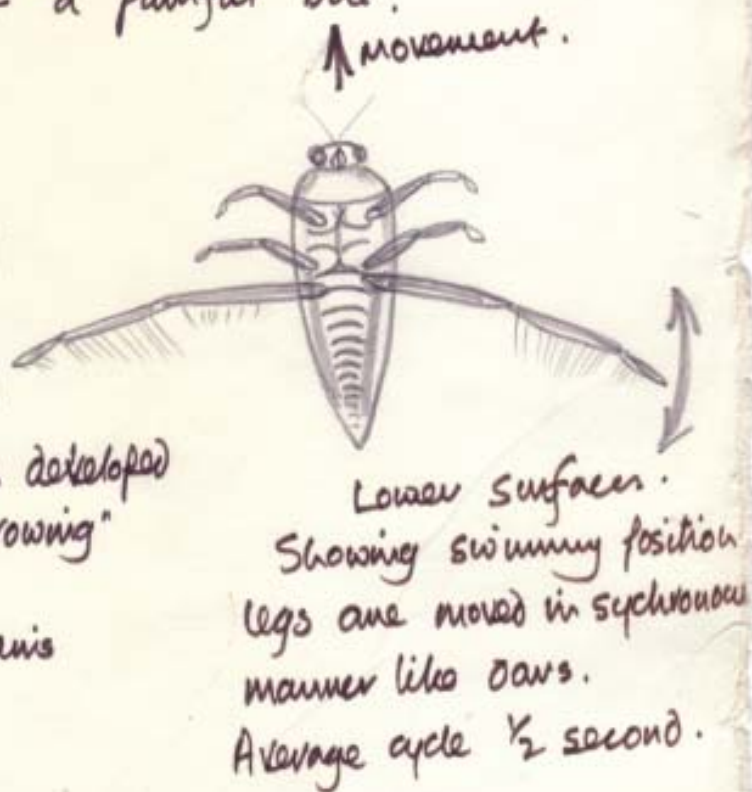
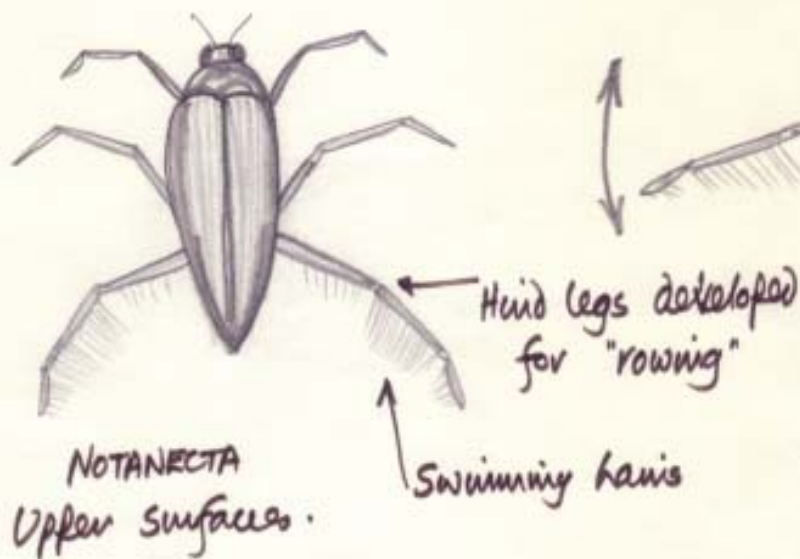
← Degenerate back legs.

Surface Dwelling beetles - Greater & Lesser Boatmen.

Greater Boatman - NOTANECTA

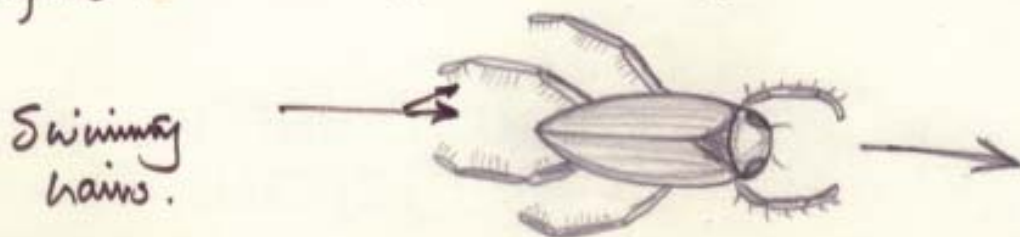
Large streamlined beetle with dark brown/tan wing covers and buff to cream/white undersides.

N.B. This beetle swims on its back with its white belly uppermost and propels itself along the surface with its 'oar like' hind legs not unlike someone rowing a boat - hence its name. The beetle is fiercely carnivorous, and care should be taken if handling it since they can inflict a painful bite.



Lesser boatman (CORIXA)

Similar to the Greater Boatman, but smaller, and swims the right way up. Colouration similar to Notanecta but not as strong or as purposeful. Swimming tends to be close to the surface but erratic, not in straight lines as Notanecta



Surface Dwelling Flies (see also beetles)

The two most common of these are the POND SKATER (Gerris) and the WATER CRICKET (Velia)

The pond skater moves with extremely rapid movements over the surface film of the water, usually where the surface is still, and near reeds etc:

Pond skaters normally move in eccentric circles but sometimes combine these with straight line movements thus:-



A pond skater would accomplish the above movement easily in 2-3 seconds.

NOTE These insects are so light, they actually sit on the surface film without passing through it:-



Indents in surface film when insect is at rest.

The Water Cricket (Velia) is a "leanyweight" version of the Pond Skater, and appears similar but more heavily built. The water cricket crawls over the surface film quite quickly, but its leg movements can be detected unlike those of the pond skater, who's movements are too fast to get anything but an impression of speed.

The water cricket does not indulge in the gyrations that the pond skater seems to occupy 90% of its time with.

INDUSTRIAL
LUBRICATION

