

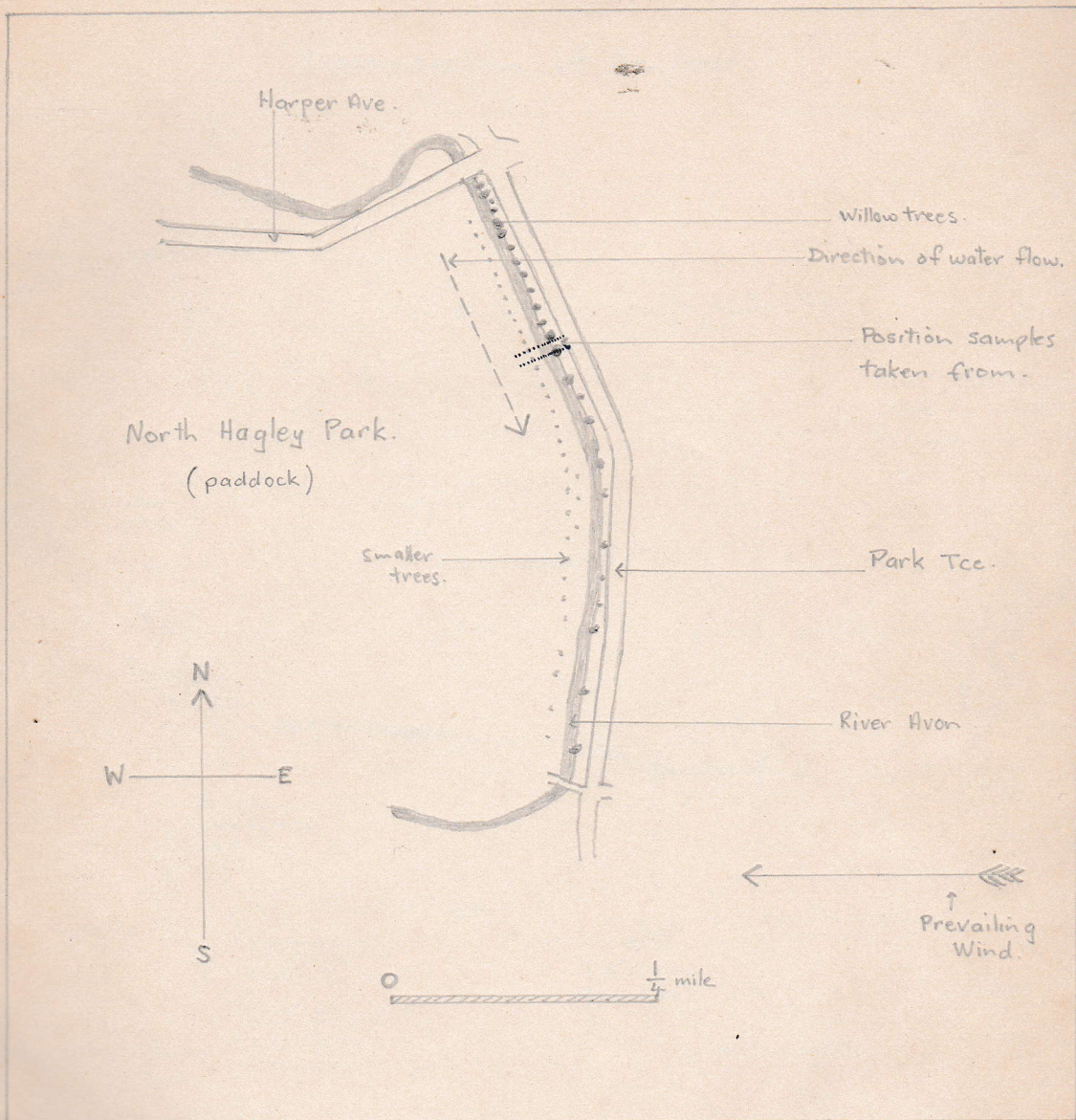
STUDY OF A
PLANT - ANIMAL COMMUNITY.

SITE : The River Avon, Hagley Park.

TIME : 11.30 a.m. 22nd. February, 1962.

CONDITIONS: Calm, cool, cloudy day.

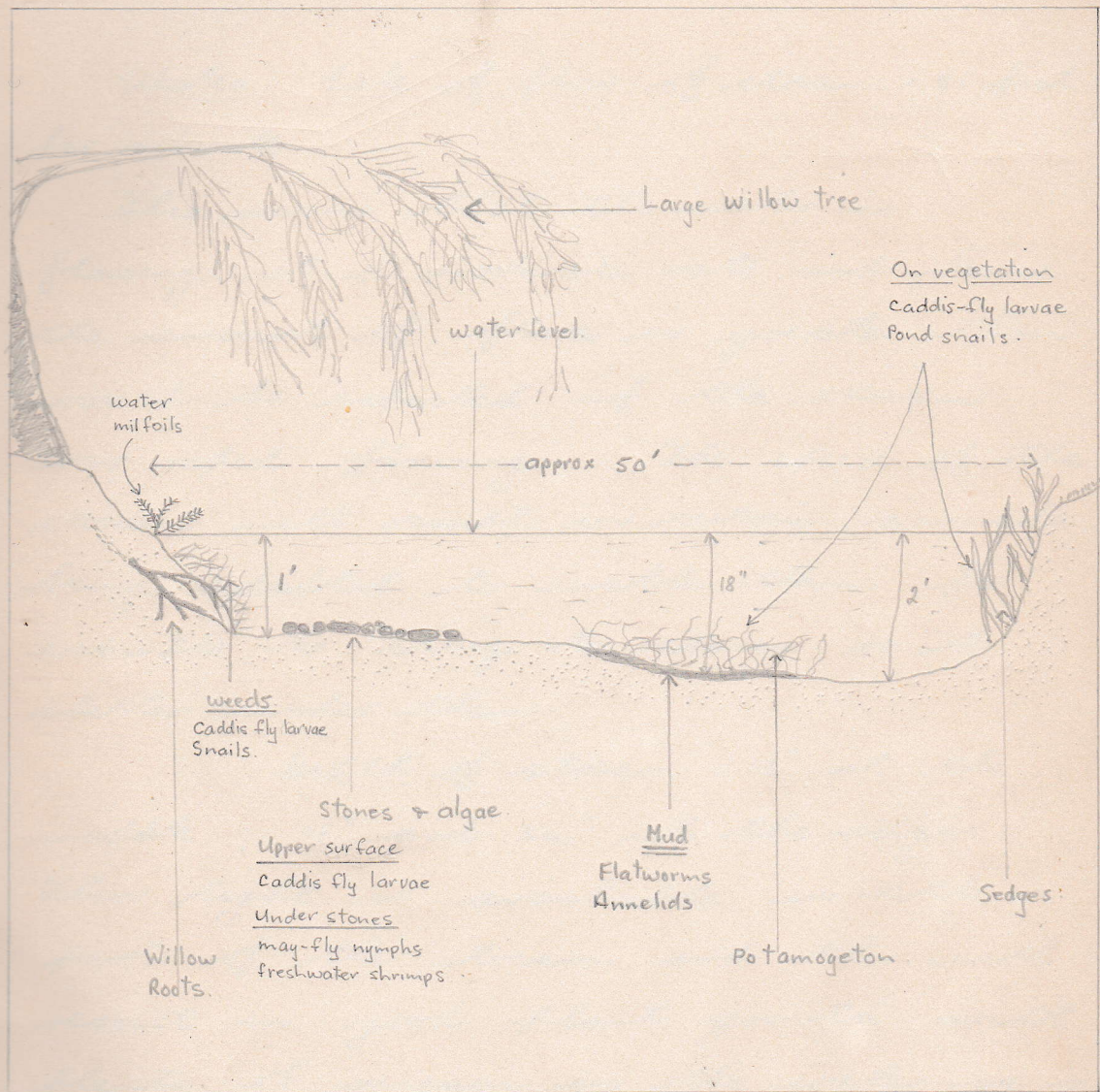
*This is a credit to you in every way,
and set out in a readily-usable form.*



General map of the area studied.

The area surveyed is flat with mown grass on its banks and an abundance of trees both close and further from the river.

Cross-section of the river.



The area considered is almost flat and the water is very clean most of the time.

Environmental Factors.

Water: rate of flow of stream = 81 feet per minute.

This means that the water is flowing at a moderate rate and hence the amount of flora is greater than would be expected if the stream was rapid flowing. The speed of the stream will result in certain animals being adapted to enable them for example to cling to stones or to shelter under them.

Depth of stream = 18" at the middle; 12" and 24" at the edges. Thus light is available in all parts of the stream and this will result in good plant growth with plenty of oxygen in the water as a result. Light is necessary for the plants to carry out photosynthesis in their cells.

Thermal properties : Water temp. = 58°F .

Air temp. = 68°F .

The water is reasonably warm and hence would expect life amongst the mud and the weeds, etc.. (a complete survey would need temperatures taken during the night and also throughout the year to determine the effect on activity during colder seasons.)

Buoyant properties : The river is a fresh water one and thus its density is one resulting in the water not being extremely buoyant. Certain animals would automatically be eliminated as they would be unable to be supported by the water.

Dissolved gases : Oxygen is present because of the abundance of plant life in the stream. The presence of dissolved carbon dioxide is unlikely because of the speed of

the river.

Drainage: One storm-water pipe allows water into the river about 20' upstream from the survey area. However, this has little effect on acidity. It only makes conditions very muddy during storms. This would tend to reduce the number of organisms present especially those that breath through gills, these becoming clogged up with mud. The amount of rainfall in Christchurch is not enough to effect a drastic change in conditions of the Avon apart from excessive run-off through storm-water.

Sunlight and Shade: On the eastern side of the stream it is rather well shaded due to the presence of large willow trees some of which reach out to half-way across the river. Hence the amount of sunlight is reduced.

On the opposite banks are smaller less spreading types of trees which allow a lot of sunlight on this side. These environmental factors result in a greater plant growth on the western side which in turn can provide many animals with food and oxygen.

Biotic Factors: (1) Effect of plants on other plants - The tall willow trees provide shade resulting in the weeds on that side under the water being a brownish-red colour, not green.

(2) Effect of plants on animals - food is provided for such animals as the caddis-fly larvae and pond snails which were observed on plants in the stream. eg. Canadian pond-weed and stonewort which is a filamentous algae.[?] Some organisms need oxygen and hence will be found mainly on the side

of the stream where there is less shade and more sunlight.

(3) Effect of animals on animals: Fish and birds can feed on various insects which possibly float on the surface and also upon larvae and nymphs in the water.

(4) Effect of man: Every now and then the river is cleaned by dragging to remove rubbish. This will undoubtedly effect rocks and stones exposing organisms living on the underside for protection, to the force of the flowing stream, washing them away. Mud will also be stirred up clogging the gills of those animals which breath oxygen. Various plants too would be disturbed or destroyed by this cleaning resulting in the loss of homes and food for many of the animals that depend upon plants for this. However this is not

as serious as much of the plant life
still remains.

Organisms Found.

Animal	Location	Respiratory Mechanism	Locomotion	Feeding habits	Food of	Special notes.
Flatworms.	Amongst the mud and stones and also the weeds.		By rhythmic wriggling of its flat body.	Carnivorous		^{eyes} two holes at the front end of the body.
Annelids.	On plants and amongst the algae on the rocks and stones.		It moves by moving its body back and forward.			A few very dark spots on the back of the body.
Fresh - water Shrimp.	On the stones as well as being underneath them.		Rapid movement of the many hairs that appear on the body			

Animal	Location	Respiratory Mechanism	Locomotion	Feeding habits	Food of	Special notes.
Caddis-fly larvae.	Lives under small stones cemented to larger ones.		By movement of its 6 legs and also by using the rear half of its abdomen.	Uses the algae which covers the stones.		The larvae was also observed in a "cocoon" which was made from small sticks etc.
Mayfly nymph.	In the shingle on the bottom of the river.	Through a set of gills at the rear end of its abdomen	It moves by flicking its tails and also by using its 6 legs.			It has 3 tails protruding from the back of the animal.
Pond Snails.	Among the weeds and on the plants.		By slow movements of the jelly-like substance on the under side of its shell.		Large plants & pond weeds.	Various species of snail observed.

Animal	Location	Respiratory Mechanism	Locomotion	Feeding Habits	Food of	Special notes.
Cyclops. Class: Crustacea. Order: Copepoda.	Open water					
Water Boatman	"			Water fleas		
Large, medium, small Beetles	"			Back swimmer amolluscs.		
Dragonfly nymphs	Weeds.			Water fleas		
Water mites	"		Uses its 8 legs.			
Potamopyrgus	"			Herbivores		
Planorbis	"			"		left handed shell.
Physastra	"			"		
Pond skater	On surface					
Bloodworms	Mud.			Rubbish		Can be other colours

Plants Found.

(1) Water milfoil : (Myriophyllum). a greenish plant which grows on the banks of the river ~~just~~ just below and also above the water level. It has finely divided leaves which are suitable for aeration in the water. This plant appears to be easily removed as quite a few samples were collected floating in open water.

(2) Stonewort (Chara) : a small filamentous plant, green in colour which is one of the algae. It is found on the bottom of the stream growing in the mud. Attached to the filaments of this plant were found orange fruiting

bodies.

(3) Canadian Pondweed (*Elodea*): a green plant growing in great abundance on the bottom of the river in the mud especially in the regions exposed to maximum sunlight. This plant shows the evolution of oxygen. Many animals, especially pond snails were found clinging to this plant.

(4) Potamogeton: This is found in conditions similar to Canadian pondweed. It usually though has longer, narrower stems and has its leaves only at the top of the plant. The leaves appear as a greenish-white colour while the

stem is brownish-white in colour. Similar animals are found clinging to it. Because of the fast rate of flow of the river this plant is always flattened out and not growing upright.

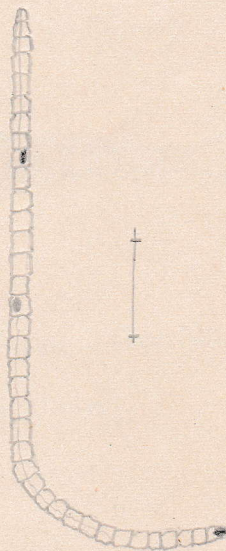
(5) A filamentous algae was found growing on most of the stones at the bottom of the river. This provides food for those organisms which cling to these rocks or stones for protection.

Dominant Organisms.



In mud

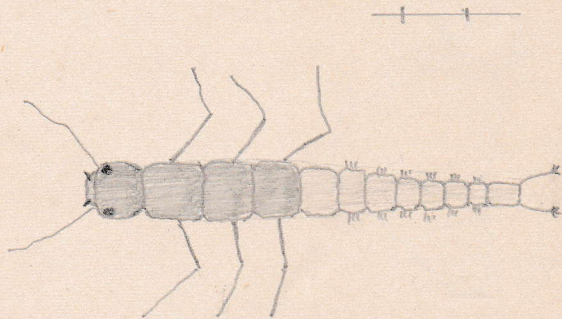
Flatworms
(Planarium)



Annelid - Tubifex
(In mud)

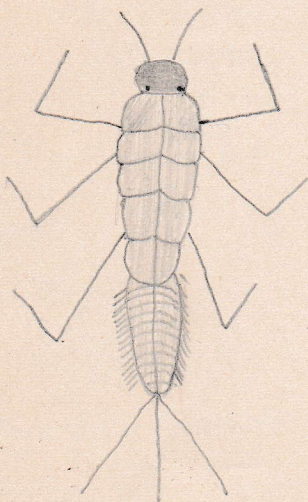


Fresh-water shrimp.
(In mud)

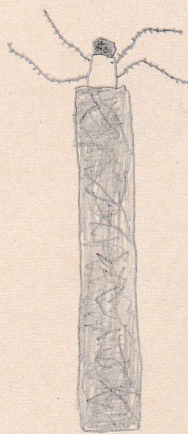


Caddis-fly larva (free living)
(under small stones)

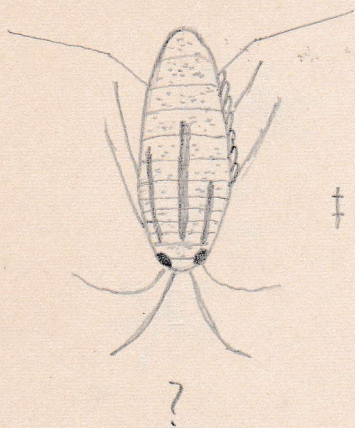
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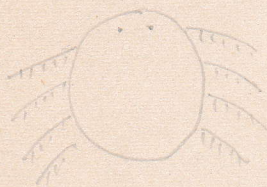
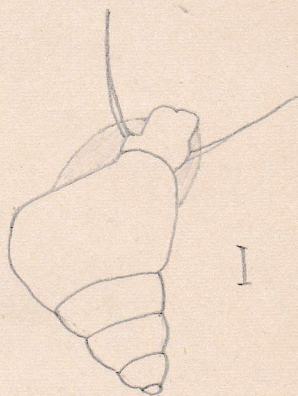
May-fly nymph
(In shingle)



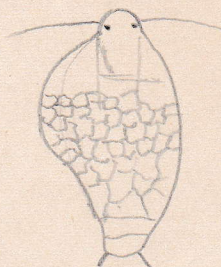
Caddis-fly larva
(also among weeds)



Shrimp



Water mite.



Rotarygus



Planorbis



Pond skater (Microvelia)



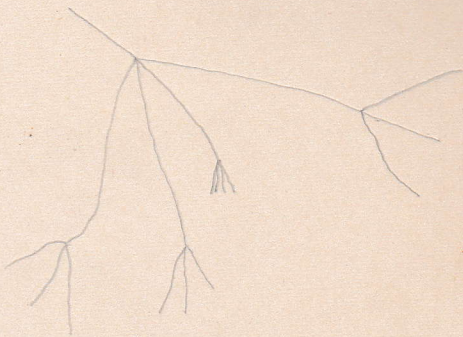
Pond snails.

Among
weeds

Dominant Plants.



Water Milfoil
(Myriophyllum)



Stonewort (Chara)



Canadian Pondweed
(Elodea)



Potamogeton.