THE CHANGING ASHLEY RIVER

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Prehistory and History

During the last glaciation the Canterbury Plains were formed of gravel brought down by the large rivers, such as the Waimakariri and Rakaia, that flowed from the great glaciers. Smaller rivers, like the Waipara, Ashley and Selwyn that originate in the foothill country near the top of the Plains, also built out gravel fans at the same time. Weathering of rock on the bare slopes gave rise to this gravel. The Plains surfaces received a coating of loess (wind-blown silt), also in glacial times; it is the material on which Canterbury soils have developed.

At the end of the glaciation, because the excessive supply of gravel ceased, the rivers began to cut down into their fans, creating the incised courses with terraces that we now see on the upper plains (each with a shingle floodplain across which the river meanders).

Near our residence, about 8 km down-river from Ashley Gorge camping ground, the Ashley River has entrenched itself, forming two major terraces. The lower one is a cliff rising about 10 m above the riverbed. The upper one (with a 30° slope on the riser), is about 3 m high. The layers of boulders, gravel, sand and clay in these terraces tell us of weather events and stream flow in prehistoric times. Comparable terraces on the north bank of the river show that its floodplain would once have been about 1 km wide.

It seems reasonable to suppose that the Ashley River floodplain in those times would have had a shifting cover of the tussocks *Poa cita* and *Festuca novaezelandiae,* along with some matagouri and a number of mat plants. By our gate is a burnt tree trunk which looks like beech. It's too big to have been put in as a fence post. Normally our rainfall is between 850 and 900 mm per annum, so a thin strand of beech, broadleaf, etc 150 years ago seems possible along the north facing terraces. A number of old beech fenceposts are on our property. Opposite us on the north bank small remnants of bush survive in a gully and on some of the south facing terraces.

A photograph taken at the beginning of the 19th century from the saddle by Robert Johnston's present-day, covenanted tussock area, on the Lees Valley Road, shows a wide shingle bed right to the foot of the southern cliff. There were fewer native trees and shrubs than there are today. Other photographs of the time show much less scrub and bush than today in the gorge and on Mt Oxford. In the 1950s and 60s I frequented Mt Oxford and the Puketeraki Range. Deer and chamois were common then but not now. Today many former slips are covered with plants. There must be less shingle making its way down the river. Presumably there was a period of accelerated erosion following accidental and planned fires lit by early Europeans.

Only 35 years ago there was active shingle to the foot of the cliff. We have observed steady retreat of the river since then. In the 1950s the river was cutting into the cliff. The North Canterbury Catchment Board put in willow and poplar poles, gabions, caissons and steel cable to prevent this. Today a stable stream meanders through dense willows here.

Vegetation Survey

I have divided the area into the following habitats:

1. Active river bed (floodplain)
2. Former river bed
3. Swamp
4. Upper terraces

Active River Bed

Today the zone of open shingle is rarely more than 50 m wide. Much of the shingle comes from collapse of the sides of "islands" in flood time.

Lupin has arrived in the past five years, working its way upstream by courtesy of stiff easterlies. It's an aggressive coloniser of bare shingle and is eaten by neither rabbits nor hares. We have seen the earlier arrivals of stonecrop and evening primrose but they had little impact on the environment. The demise of rabbits with the spread of RCV may have contributed to the recent rapid encroachment of broom on to this zone. The gorse mite is having an effect on gorse which is much less common than broom.

In stable side streams willows are forming thickets. The water is often covered with watercress, with monkey musk on the edges.

Muehlenbeckia complexa was one of the few riverbed plants to withstand the droughts of 1997 and 1998, but a wet 1999 has seen the resurgence of the other species. The major pioneer species of sand after a flood is *Raoulia tenuicaulis.*

The shrinkage of this zone has had a dramatic effect on bird life. Five years ago banded dotterels, pied oystercatchers, pied stilts, and black fronted terns were common. Today the only common riverbed birds are paradise ducks and Canada geese.

In addition to the species listed below there are a number of unidentified rushes and sedges, bryophytes and lichens.

[*N* = native to the area *R* = rare in the area *X* = none have survived flood and/or drought *W* = largely confined to small stable side streams]

Acaena novaezelandiae N	Bidibid	*Lolium perenne*	Perennial ryegrass
A. inermis N	Bidibid	*Lotus pedunculatus*	Lotus
A. anserinifolia NR	Bidibid	*Lupinus arboreus*	Lupin
Acer pseudoplatanus X	Sycamore maple	*Mimulus guttatus W*	Monkey musk
Aristotelia serrata NX	Wineberry	*Muehlenbeckia complexa N*	Pohuehue
Bromus sp.	Brome	*Myriophyllum* sp. *NW*	Water milfoil
Carex spp. W		*Myrsine australis NX*	Mapou
C. buchananii NW		*Nothofagus solandri NRX*	Black or mountain beech
Carmichaelia australis NRX	N.Z. broom		
Cassinia leptophylla N	Tauhinu	*Oenothera* sp.	Evening primrose
Clematis vitalba X	Old man's beard	*Oxalis exilis N*	
Coprosma rugosa NRX		*O. lactea NRX*	
C. robusta N	Karamu	*Plantago lanceolata*	Narrow leaved plantain
C. propinqua NX			
Coriaria sarmentosa N	Tutu	*Poa cita N*	Silver tussock
Corokia cotoneaster NX	Korokio	*Potomogeton cheesemanii NW*	Copper weed
Cortaderia richardii NW	Toetoe	*Pseudognaphalium* sp. *N*	
Cytisus scoparius	European broom	*Pseudopanax arboreus NX*	Fivefinger
Discaria toumatou	Matagouri	*P. crassifolium NRX*	Lancewood
Echium vulgare	Vipers bugloss	*Raoulia tenuicaulis N*	Mat daisy
Elodea canadensis W	Canadian water weed	*R. australis N*	
		R. glabra NR	
Epilobium melanocaulon N	Willowherb	*Rorippa nasturtium-aquaticum W*	Water cress
E. spp N?	Willowherb	*Rumex acetosella*	Sheep's sorrel
Gnaphalium luteoalbum N		*Salix* X *reichardtii W*	Pussy willow
G. spp.		*S. fragilis W*	Crack willow
Hebe salicifolia N	Koromiko	*S. alba W*	White willow
H. speciosa cultivar? N? RX		*Scleranthus uniflorus NRX*	
H. sp. cf. traversii NX		*S. biflorus N*	
H. canterburiensis? NX		*Sedum acre*	Stonecrop
Hydrocotyle heteromeria NX		*Trifolium repens*	White clover
H. moschata NX		*T. dubium*	Suckling clover
H. novaezelandiae NX		*Ulex europaeus*	Gorse
Kunzea ericioides N	Kanuka	*Verbascum* sp.	Mullein
Lemna minor W	Duckweed	*Wahlenbergia albomarginata NR*	
Leptospermum scoparium N	Manuka	*W. gracilis* N	

Former Riverbed

Since the last major flood on 18 July 1991 this zone has come to be dominated by grasses, broom and gorse. Before RCV rabbits created open areas with only mat plants in evidence. *Lagurus ovatus* is the most vigorous coloniser of sandy areas.

Agrostis tenuis	Browntop	*Raoulia australis N*	
Bromus sp.	Brome	*Rosa rubiginosa*	Sweet briar
Echium vulgare	Vipers bugloss	*Rubus fruticosus* agg.	Blackberry
Dactylis glomerata	Cocksfoot	*Salix alba*	White willow
Lagurus ovatus	Harestail	*S. fragilis*	Crack willow
Muehlenbeckia complexa N		*S.* X *reichhardtii*	Pussy willow
Pinus radiata R		*Sedum acre*	Stonecrop
Populus nigra	Lombardy poplar	*Verbascum* sp.	Mullein

Swamp

Permanent streams and seepages under willows, some very large, characterise this zone. Fifteen years back a stream made walking to the river with dry feet impossible but now a mat of willow roots occupies the place. The water emerges downstream. Fifteen years back a pond about 20 m across existed but now it, and the raupo by it have disappeared, taken over by willows. An understorey of small trees, especially *Pittosporum ralphii*, escaped from our property above, is developing, with dense cover of ferns in wetter places. Grassy areas have been taken over by blackberry which then provides support for *Muehlenbeckia australis*. In the past decade *Clematis vitalba*, whose seed would have been blown here from Ashley Gorge to the NW, has come to dominate these formerly grassy places. It swathes small trees and even climbs to the tops of tall willows. North-west winds break willow branches which on the ground provide support for this liane. There is some indication that *Muehlenbeckia* may take over from the *Clematis*, possibly because it is in leaf longer. In the past five years Himalayan honeysuckle and sycamore maple have arrived. The latter has come from a copse in the lower Glentui NNE of here. Winds from that direction are rare. Recent arrival of *Clematis paniculata* could have been by the same wind. Sycamore saplings are up to 2 m high. In the shade of the willows new species of *Coprosma* continue to arrive. This year we discovered *Corybas* for the first time. The frost tender *Melicytus ramiflorus* is starting to become significant under willows.

Acer pseudoplatanus	Sycamore maple	*Dactylis glomerata*	Cocksfoot
Agrostis capillaris	Browntop	*Elytrigia repens*	Twitch
Asplenium colensoi NR		*Erigeron* sp.	Fleabane
A. flabellifolium N	Necklace fern	*Fuchsia excorticata* NR	Kotukutuku
A. hookerianum N		*Galium aparine*	Cleavers
A. lucida var. *lyallii* N		*Gastrodia cunninghamii* N	
A. terrestre N		*Griselinia littoralis* NRX	Broadleaf
A. bulbiferum N	Hen & chickens fern	*Haloragis erecta* N	
		Hebe salicifolia N	Koromiko
Blechnum discolor NR (1)	Crown fern	*Helichrysum bellidioides* NR	Narrow leafed
B. fluviatile N	Kiwakiwa	*Hoheria angustifolia* NR (1)	ribbonwood
B. chambersii N		*Hypolepis millefolium* NR	
B. pennamarina N		*H.* sp. N	
B. novaezelandiae N		*Leycesteria formosa*	Himalayan honeysuckle
B. procerum NR	Crown fern		
Calystegia sepium	Convolvulus	*Lotus pedunculatus*	Lotus
Carex secta NW	Niggerhead	*Melicytus ramiflorus* N	Mahoe
C. spp NW?		*Microtis unifolia* N	
Carpodetus serratus NRX	Putaputaweta	*Mimulus guttatus* W	Monkey musk
Cirsium arvense	Californian thistle	*Muehlenbeckia australis* N	Pohuehue
C. vulgare	Scotch thistle	*Parsonsia heterophylla* N	
Clematis paniculata NR	Puawhananga	*P. capsularis* N	
C. vitalba	Old man's beard	*Pellaea rotundifolia* N	Button fern
Coprosma robusta N	Karamu	*Phormium tenax* NR	N.Z. flax
C. species T NR		*Phymatosorus diversifolius* N	Hounds tongue
C. rhamnoides NR		*Pittosporum tenuifolium* N	Kohuhu
C. propinqua N		*P. ralphii*	Karo
C. propinqua X *robusta* N		*Polystichum vestitum* N	Prickly shield fern
Cordyline australis N	Cabbage tree	*P. richardii* N	
Corybas sp. N		*Populus nigra*	Lombardy poplar
Cotoneaster sp.		*Potamogeton cheesemanii* NW	Copperweed

Pseudopanax arboreus NR		*S. fragilis*	Crack willow
Ranunculus repens	Five finger	*Sonchus oleraceus*	Sow thistle
Rorippa nasturtium-aquaticum W		*Sambucus nigra*	Elderberry
		Schefflera digitata NR	Pate
Rosa rubiginosa	Water cress	*Solanum* sp	
Rubus fruticosus agg.	Sweet brier	*Sophora microphylla* NR	S.I. kowhai
Rumex acetosella	Blackberry	*Thelymitra* sp N	
Rumohra adiantiformis N	Sheep's sorrel	*Typha angustifolia* NW	Raupo
Salix X *reichhardtii*	Pussy willow	*Urtica dioica*	Perennial nettle
S. alba	White willow	*Vinca major* R	Periwinkle

Upper Terraces

Broom dominates this zone, even places that were 10 year ago blackberry thickets. *Muehlenbeckia* and recently *Clematis vitalba* invade any cleared ground. Elder, karo, *Cotoneaster*, and recently kohuhu are becoming common emergents. They provide a shaded environment for new arrivals such as orchids.

Acaena novaezelandiae N	Bidibid	*Muehlenbeckia australis* N	Pohuehue
Achillea millefolium	Yarrow	*M. complexa* N	
Agrostis capillaris	Browntop	*Myrsine australis* NR (1)	Mapou
Asplenium flabellifolium N		*Oxalis exilis* N	
Botrychium australe N		*Parsonsia heterophylla* N	
Bromus sp.	Brome	*P. capsularis* N	
Cassinia leptophylla NR	Tauhinu	*Pelargonium inodorum* N	
Cirsium arvense	Californian thistle	*Phleum pratense* RX	Timothy
C. vulgare	Scotch thistle	*Phymatosorus diversifolius* N	Hound's tongue
Clematis vitalba	Old man's beard	*Pinus radiata* R (1)	
C. propinqua N		*Pittosporum tenuifolium* N	Kohuhu
C. propinqua X *robusta* N		*P. ralphii*	Karo
C. rhamnoides NR		*Poa annua*	
C. robusta N	Karamu	*Pteridium esculentum* N	Bracken
Cordyline australis N	Cabbage tree	*Pterostylis* sp. N	
Cotoneaster sp.		*Ribes uva-crispa* R	Gooseberry
Cytisis scoparius	European broom	*Rosa rubiginosa*	Sweet brier
Dactylis glomerata	Cocksfoot	*Rubus fruticosus* agg.	Blackberry
Elytrigia repens	Twitch	*Rumex acetosella*	Sheep's sorrel
Galium aparine	Cleavers	*Solanum laciniatum* NR	Poroporo
Griselinia littoralis NR	Broadleaf	*S. nigrum*	Black nightshade
Helichrysum lanceolatum NR		*Stellaria media*	Chickweed
Hydrocotyle novaezelandiae N		*Ulex europaeus*	Gorse
		Uncinia uncinata NR	Hooked sedge
Lolium perenne	Perennial ryegrass	*Urtica dioica*	Perennial nettle
Melicytus ramiflorus NR	Mahoe		

Prognosis

Until the mid 1990s there was at least one flood over 100 cumecs every year. Zones 1 and 2 were regularly cleared of most vegetation. However in the swamp even during the big flood of 2 May 1991, which reached about 800 cumecs, with the water 1.5 m up the cliff, only minor scouring occurred. This indicates that stream channels will become willow choked and that

shingle river floodplain will disappear. Under tall willows, evergreen trees and shrubs whose seeds are dispersed by birds will become important as will sycamore maple. Blackberry will diminish. On the edge of the trees old man's beard and *Muehlenbeckia* will be rampant. If a parasitic fungus arrives to attack the old man's beard *Muehlenbeckia* will succeed it. The upper terraces will be dominated by *Pittosporum ralphii* which is fast growing and tolerant to drought. All this assumes no human intervention. In fact we are planting natives in the swamp and upper terraces and clearing scrub from the latter. Our hope is that these will seed and succeed the present woody plants in these places.

NOTE: MAORI LORE OF PART OF CENTRAL CHRISTCHURCH – SOME ANCIENT TI KOUKA (CABBAGE TREES)

The Maori name for the original Pakeha Market Square of the 1850's and 1860's, now Victoria Square, is Te Uranga U, the landing place of the canoes or waka. The site of Puari pa stretches from the Carlton Mill Corner to the Town Hall, including the Law Courts and the Old Provincial Council Chambers area on the banks of the Avon river. Puari, a large and important pa, is an old site belonging to Waitaha and Kati Mamoe people, dating from before 1700. On this pa site beside the Avon is a very old ti kouka, actually in the form of a ring – an original old tree sent up shoots around its base; they form a circle of mature trees around the site of their now dead parent.

The central tree was there at the time of the occupation of the Puari pa. Another single old ti kouka tree is within the enclosed courtyard beside the Council Chambers, and there is another old, ring ti kouka tree across Gloucester Street at the Law Courts area of the Avon.

The Maori name for Victoria Square was given to me by Bill Karaitiana; the other information was from a kaumatua at Taumutu, the late Riki Ellison. He passed it on to Terry Ryan (Ngai Tahu Group Management Ltd) who told it to me.

Murray Parsons