CHAPTER 5

‘Fair streams were palsied in their onward course’:
The desirability of flowing waters

Land most fertile, water fresh and pure from limestone, climate unequalled, population increasing, Railway transit commands all markets. The Lakes Entrance opened to all intercolonial ports. This grand estate may be briefly described as river flats of unsurpassed richness, having depth of soil that ages formed and time cannot work out. A frontage of about six miles to the renowned Mitchell River, besides other water facilities, insuring permanent supply.

Campbell Pratt and Co., real estate agents

It was said there was only two or three rivers to cross, but we found more than five or six, and all of them muddy on the banks, and never a day hardly with passing creeks that we often had to lower the drays with ropes, and carry the things on our backs ... It has been a mad undertaking, but it may turn out better.

John Gellion

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2  *Gippsland Times*, 12 February 1886, Campbell Pratt and Co.’s advertising for the sale of the subdivided Axelea Estate near Bairnsdale.

Introduction

Surface waters are the most visible part of the hydrological cycle. As such, they have dominated human responses to the cycle in most aspects: physical, economic, social, emotional and spiritual. This chapter explores the interaction of flowing waters with these aspects of life in colonial Gippsland.

It is on the Earth’s surface that humans have the most capacity to reshape hydrological systems. However, hydrological intervention is a choice. To first think it desirable and then act upon it requires a particular type of world view. Unlike Australia’s Indigenous custodians, the colonial settlers were not content to let the continent’s variable waters flow at their own will. Dow has described in detail the entwined and seasonably variable relationship between the Kurnai and the surface waters of the Gippsland Lakes Catchment (GLC). Whereas the Kurnai were content to adapt to the changeability of the waters, affording the water both ecological and spiritual significance, the displacing Europeans perceived the catchment’s moving waters very differently. Gippsland’s rivers were both an obstacle to be surmounted and a resource to be used and exploited.

The European-inspired agricultural economy they wanted to build was profoundly mismatched to their actual environment. European farming evolved in a more regular hydrological regime, both in the amount and distribution of rainfall and the resulting flow in rivers. In Gippsland, the attempt to reproduce European agriculture was challenged by the variability in available water, as well as by predation and diseases.

The settler’s major response to the ‘problem’ of European agriculture in a non-European land was to regularise and redirect flow, wherever technically and economically feasible. As the nineteenth century progressed, money and technology became increasingly available, and the rivers were changed to achieve permanent, moderate flow as much as possible. The capacity to effect sweeping hydrological change increased during the nineteenth century as a whole, and was supported by an understanding of hydrology that was quantitative and volumetric. This understanding was nested within a broader view of nature as a machine, or as a puzzle that could be teased out by breaking the world down to

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its component parts. This mathematical rendering of flowing water obscured the other connections of water, especially to the other species that depended on the very variability that settlers wanted to erase.

Economic life was founded upon the metaphor of flow, and the actual flow of goods was facilitated in a large part by water transport; ‘water and progress ran together’. Progress meant evening out the vagaries of flow, aiming for seasonal uniformity and even geographical distribution. To improve flow was the heart of prosperity. This idea was equally influential in drainage practices (see Chapter 6) and the same flow metaphors are found in the spiritual and recreational practices of the settlers, each reinforcing the other.

This chapter begins by examining the metaphorical aspects of flow, before moving on to a discussion of settler’s physical dependency upon flowing water. This order is significant because cultural understandings of flowing waters, especially from religious teaching, buttressed their choice to act in the ways they did in the physical environment of the catchment. The examples of Sale’s water supply and a discussion of the tanning industry illustrate the interdependencies between social, economic and cultural aspects of flow. The remainder of the chapter details the ways colonial Gippslanders made hydrological alterations to improve flow, in particular focusing on bridge construction, snagging and the creation of the permanent entrance.

Metaphorical flow

The historical uses of river flow mimic the diversity of definitions of the word itself. Table 5.1, sourced from Haslam’s The Historic River, includes medical, religious, magical, recreational and ornamental ways people use rivers in addition to the more prosaic uses such as cleaning and processing goods.


Table 5.1: Historic uses of rivers in Europe.

<table>
<thead>
<tr>
<th>Use</th>
<th>Variations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking</td>
<td>Residents, travellers and domestic animals</td>
</tr>
<tr>
<td>Cooking</td>
<td>Boiling, steaming, poaching various foods</td>
</tr>
<tr>
<td>Cleaning</td>
<td>Clothes, people and animals (e.g. sheep-dip), homes, farmyards, stables etc., roads and other built-up surfaces</td>
</tr>
<tr>
<td>Other domestic supply</td>
<td>Fire engines, hydrants, heating by volcanic water (Rekyjavik), water meters etc.</td>
</tr>
<tr>
<td>Food and drink</td>
<td>Fishing (rivers or constructed fish ponds), waterfowl, water cress (rivers or constructed cress beds), irrigation, draining, grazing, alcoholic and other drinks</td>
</tr>
<tr>
<td>Materials (source of or processed in the river)</td>
<td>Osiers and withies (poles and baskets), rushes (chairs, matting and lights), reeds (thatch), strewing plants, tussock sedges (stools). Soaking of flax, hemp and fleeces, extraction of sand and gravel</td>
</tr>
<tr>
<td>Medicinal</td>
<td>Springs, spas, water plants, leeches</td>
</tr>
<tr>
<td>Religion</td>
<td>Holy wells, baptism, ritual cleansing, pilgrimages to holy rivers and springs. Choice locations for religious hermits/communities</td>
</tr>
<tr>
<td>Magic</td>
<td>Rain-making, rain and flood removing, fertility, other magic fountains and springs</td>
</tr>
<tr>
<td>Industry</td>
<td>Providing power through watermills to grind grains, olives and other plants, to fashion armour, jewellery, tanning, fulling, dyeing, making paper, gunpowder, metal products, boilers for steam engines. Processing and washing of mining ore</td>
</tr>
<tr>
<td>Transport</td>
<td>Boats for trade, business and pleasure</td>
</tr>
<tr>
<td>Recreation and ornamental purposes</td>
<td>Ornamental fountains and water gardens, lakes, river parties, fishing, walking, picnicking, camping, swimming, paddling, water clocks, punting, watering residential gardens, freshwater pearls for jewellery</td>
</tr>
<tr>
<td>Waste disposal</td>
<td>Sewage, factory, mine and farm effluents, non source point runoff from farms and roads, general waste, drowning unwanted animals, murder and suicide of persons</td>
</tr>
<tr>
<td>Punishment</td>
<td>Ducking, drowning</td>
</tr>
<tr>
<td>Defence and attack</td>
<td>The strategic use of river bends, marshes, moats, stakes in a river, chains, fortified bridges, forts</td>
</tr>
</tbody>
</table>


Based on a survey of European rivers from 1400 to approximately 1800, Haslam’s list is evidence of a widely shared cultural world (a gestalt, if you will) centred on the importance of flowing water in rivers, springs and wells. It demonstrates the intertwined, holistic nature of flowing water as it spread through the physical, social, intellectual, economic and spiritual life of Europe.
The word ‘flow’ is an adaptable one, with 10 different uses as a verb. Only one relates strictly to hydrology. This indicates how much the visual action of flowing water has penetrated the English language. Flow has become metaphorical for a range of meanings, principally revolving around movement.

- To move along in a stream: *The river flowed slowly to sea.*
- To circulate: *The blood flowing through one’s veins.*
- To stream or well forth: *Warmth flows from the sun.*
- To issue or proceed from a source: *Orders flowed from the office.*
- To menstruate.
- To come or go as in a stream: *A constant stream of humanity flowed by.*
- To proceed continuously and smoothly: *Melody flowed from the violin.*
- To hang loosely at full length: *Her hair flowed over her shoulders.*
- To abound in something: *The tavern flowed with wine.*
- To rise and advance, as the tide (opposed to ebb).\(^7\)

Flow is generally a positive description, regardless of which sphere of life it is applied to. When we describe a dancer as fluid we are describing the flowing quality of her movement, made possible by an enviable suppleness. In landscaping, blue-flowered plants with long flexible stems can appear to flow down banks. Mentally, we speak of ‘the flow of ideas’, or ‘a stream of consciousness’. Emotionally, descriptions like ‘my heart was overflowing with love’ are common. Spiritually, the flow of rivers can be taken as a metaphor for life’s passage, as in Alfred, Lord Tennyson’s poem *Crossing the Bar*, which correlates crossing the bar of an estuary with passing into death.\(^8\) The verb ‘flow’ is then modified by descriptions of speed, as in a measly trickle of water, or a raging torrent. While it is describing the speed of water, the adverb is actually pointing to meanings of abundance or lack.

Examples of flow metaphors in the newspapers surveyed suggest that Gippslanders shared this basic meaning. The slow action of water eroding stone was used to describe progress towards getting the railway in 1869.\(^9\) The desired effect of the proposed railway was likened to a stream:

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\(^7\) Dictionary.com (accessed 19 February 2007).
\(^9\) *GT*, 19 October 1869.
A journey of six or seven hours would land a man in Melbourne from Sale while goods and cattle would be going down in almost a continuous stream, the loads being augmented at the various stages, thereby opening up and developing the great tract of country between Melbourne and Sale.\textsuperscript{10}

The railway would be an improved river, suffering none of the variability inherent in actual water transport. Flow, money and economic growth were frequently linked, and this association remains consistent.\textsuperscript{11} These examples demonstrate how settlers thought about the flow of water, goods, people and money, the foundation of their economic life. Importantly, these positive perceptions were reinforced by the symbolic depictions of flow in their spiritual and social lives.

The flow metaphor was used to describe social events and issues, from the growth of the Mechanic’s Institute library in Sale in 1862 to the New Year’s revelry at Dutson in 1891.\textsuperscript{12} Another way was in poetry, which regularly employed the dualism of movement and stagnation. The chapter title is derived from poetry published by Gippsland resident and future deputy prime minister, Allan McLean.\textsuperscript{13} A poem about the

\textsuperscript{10} \textit{GT}, 23 October 1869, report of the Public Meeting at Rosedale. For other political uses of flow metaphors, see \textit{GT}, 23 February 1881, comparing immigration to building a bridge across the ocean; \textit{Moe Register}, 22 December 1888, ‘waves of prosperity have passed over the metropolis, the Premier has a phenomenally bright budget to disclose, from which it is hoped vivifying rivulets will run to all parts of the country’; \textit{GT}, 16 August 1897, Allan McLean on Federation: ‘The native born in my district are sensible young men, ready to part with a substance for a problematical benefit of being permitted to drink at the springs of national life’.

\textsuperscript{11} For example, see \textit{GT}, 4 December 1863, a correspondent from Stratford complaining how the loss of the bridge and lack of legal representation in the town is impeding the flow of money; \textit{GT}, 5 July 1866, expressing the desirability of a flow of homesteads across Gippsland; \textit{GT}, 12 September 1874, describing free trade policies with a positive flow metaphor; \textit{GT}, 7 March 1876, flow of benefits expected from canal construction.

\textsuperscript{12} \textit{GT}, 17 January 1862, describing the flow of books and periodicals arriving at the Sale Mechanic’s Institute; \textit{GT}, 5 January 1891, Dutson correspondent: ‘Your numerous readers in Dutson will expect to hear from me, and though I feel more inclined to sleep than write, I suppose I must wake up to the occasion, but I must tell them first that if they make their entertainments so seductive and lasting they must not expect “their own” to go through it all, and then write an account of it without a fair amount of rest. Some of the members of our community seem to partake of the nature of “the Brook” to go on for ever, but I don’t, and what’s more I won’t, but I’ll “flow” on now till I run out. New Years day is the day of days to the rising generation of Dutson’. Other examples include \textit{GT}, 14 March 1862, using flow metaphors to describe cricket matches between Bairnsdale and Omeo; \textit{GT}, 29 May 1863, the cup to overflowing celebrating the marriage of the Prince of Wales; \textit{GT}, 9 August 1865, ‘no channel into which the stream of benevolence would not flow’.

\textsuperscript{13} A longer extract makes the adulation of movement clear: ‘Air ceased to palpitate, and earth to quake/ The sea grew torpid as a stagnant lake./ There bloom’d no living plant on vale or hill;/ The trees stood darkly calm and deadly still;/ The laws of nature lost their vital force;/ Fair streams were palsied in their onward course;/ And stretch’d as motionless over sterile plains./ As frozen currents in a dead man’s veins./ There stirr’d upon the earth nor pulse nor breath;/ The world was wrapp’d in universal death.’ Morgan, \textit{The literature of Gippsland}.  

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Mitchell River published in 1865 expressed a hope for ‘stately mansions’ and ‘palaces gorgeous’ to adorn its banks and sweetly flowing waters.\textsuperscript{14} Further examples are cited when discussing the opening of the permanent entrance later in this chapter.

The consistency of flow metaphors in religion is most striking. The \textit{Gippsland Times} regularly printed a religious column throughout the study era. Accounts of church events described with flow metaphors are common. On 5 April 1878, the column began with ‘O God, Thou faithful God/Thou fountain ever flowing’. In 1882, the sermon dwelt at length on thirst, water and flowing rivers:

> In heaven alone, the thirst of the immortal soul after happiness shall be satisfied. There the streams of Eden will flow again. They who drink of them shall forget their earthly poverty, and remember the miseries of the world no more. Some drops from the celestial cup are sufficient for a time to make us forget our sorrows even while in the midst of them. What then may we not expect from the full draughts of those pleasures.

It is this fundamental religious symbolism of water – symbolism rooted in the self evident and natural attributes of water – that permeates the Bible and the whole biblical story of creation, fall and salvation. We find water at the very beginning, in the first chapter of Genesis, where it stands for creation itself, for the ‘cosmos’ in which the Creator rejoices for it reflects and sings His glory. We find it as wrath, judgement and death in the stories of the Flood, and of the annihilation of the Pharoah and his chariots under the waves of the Red Sea. And we find it finally as the means of purification, repentance and forgiveness in the baptism of St John, the descent of Christ into the waters of the Jordan, and in his ultimate commandment ‘go ye and baptise’.\textsuperscript{15} Biblical flow metaphors reinforced the central role of baptism.\textsuperscript{16} While it would be wrong to argue that religious belief created flow-altering behaviour, the Bible nevertheless was the go-to-book for how to live and think. It offered justification for looking at the colonial waterscape and finding it wanting.

\begin{itemize}
\item \textsuperscript{14} \textit{GT}, 25 February 1865.
\item \textsuperscript{16} Y Feliks, \textit{Nature and man in the Bible: Chapters in biblical ecology}, Soncino Press, London/Jerusalem/New York, 1981. In addition to the role of water in the significant biblical stories, he shows how ecology in general played an important role in biblical texts: ‘The Biblical writings are the work of men who were close to nature and to agriculture, and so derived their inspiration from them’.
\end{itemize}
A second source of messages about the desirability of pure, flowing water came from the temperance movement. Temperance societies advocated the limited use of or total abstinence from alcohol, and commonly employed imagery of flowing water in their work. Without making a detailed comparative study, Gippsland does not appear to be more or less drunken than any other part of colonial Australia. Those who you would expect to complain about alcohol (the clergy) certainly did.\(^{17}\) Going on ‘a spree’ was a regular outlet for the monotony of the laborious country life. For example, at Eagle Point there were annual regattas where ‘unlimited supplies of liquor were served to lusty pioneers, who thought nothing of riding or rowing a distance of twenty miles to souse themselves with Jamaica rum or beer’.\(^{18}\)

Gippsland had a variety of temperance organisations, and was regularly visited by evangelists, like Mr Horspool who spent three days in December 1888 in Warragul.\(^{19}\) Non-temperance groups sometimes had temperance talks, such as the 1881 Working Men’s Meeting at which the Rev. Hardy of the Baptist Church spoke:

[He] urged upon those present the duty of wholly freeing themselves from the pernicious habits of the period, and of influencing others to abandon indulgence in ardent liquors.

He mentioned some facts showing that alcohol not only injured

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\(^{17}\) For example, Rev. Francis Hales was one of the early Church of England clergy, dispatched to Gippsland in July 1848. Soon after his arrival in the Port Albert region, Hales preached to about 50 ‘of their drunkenness and sins in plain language’, and later complained that some of his morning attendees for service rode up drunk for the evening one. AE Clark, *The church of our fathers: Being the history of the Church of England in Gippsland, 1847–1947*, Diocese of Gippsland, Sale, 1947, pp. 17 and 22. Rev. Login wrote: ‘The marriage ceremony was too often ignored, drunkenness was sadly prevalent – not a continuous imbibing of strong drink, but in violent outbursts of the vice after a considerable time of self restraint’. JW Leslie & HC Cowie, *The wind still blows: Extracts from the diaries of Rev WS Login, Mrs H Harrison and Mrs W Montgomery*, the authors, Sale, 1973, p. 34.

\(^{18}\) Recollections of Bushman (actually Rowland Bell of Metung), published in *Every Week*, 18 June 1940. Reproduced in *East Gippsland Historical Society Newsletter*, vol. 1 no. 3.

\(^{19}\) The index to the *Gippsland Times* records five groups: the Church of England temperance society based at Longford, the Gippsland Temperance League, the International Order of Rechabites, the Rosedale Temperance Society and the Sale Temperance League. I. Kennett, *Index to the Gippsland Times 1861–1900*, Centre for Gippsland Studies, Monash University, Churchill, 1995. There were also organisations not listed in the index, such as the Independent Order of Good Templars and the branch of the Women’s Christian Temperance Movement, which formed in 1887, the result of the ‘crusade’ by Rev. Phillip Moses. It was principally associated with the Presbyterian Church. Maffra had a temperance hall by 1884, which the Salvation Army used to hold services in. D Kemp, *Maffra: The history of the shire to 1975*, Shire of Maffra, Bairnsdale, 1975, p. 72. For Mr Horspool, see *Moe Register*, 8 December 1888. Part of the proceedings included a public march through the streets by children.
the body, but weakened and debased the mind, making men careless of their moral obligations, neglectful of their families and sometimes brutal to lower creation.20

There were also innumerable tea meetings recorded in the pages of all papers, at which both resident and visiting clergy would speak.

Temperance organisations all shared the metaphor of flowing water. Temperance meetings and publications regularly employed poetry, prose, song and lectures incorporating water metaphors. Sadly, records of actual meetings in Gippsland are rare. One of the few found is in the *Gippsland Mercury* on 3 February 1877, which recorded that at a temperance meeting in Bairnsdale the entertainment (apart from the lecture) was songs, one of which was called the ‘River of Life’.21 A better indication of the probable content of the lectures and sermons delivered during crusades can be derived from temperance journals. The Victorian Temperance Society published a monthly magazine commencing in 1851. Its first issue contained a dialogue between six characters representing six different virtues of drinking water instead of wine. Water was ‘the draught of inspiration, the liquor of the skies, the nectar of gods, the true stream from Mount Parnassus, the best mirror of the beauty of Narcissus, and the wine of bards and patriots’. And that was only the first character speaking! Others went on to note the worship of water in other religions, its health-giving properties causing ‘the blind to see, the lame to walk and the leper to be cleansed. It is the Aesculapius of the elements, the saviour of the sick and the nourisher of the hale’. Finally, it made the perfect beverage to toast political victories.22

Again, it is unwise to base an argument for promoting flowing waters solely on the activities of temperance campaigners. There are enough sardonic quips and outright hostile letter exchanges recorded in the papers to know that the temperance movement was not universally well regarded.23 In a lengthy exchange in 1891, the Briagolong correspondent to the *Gippsland Times* said:

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20 *GT*, 11 July 1881.
21 *GM*, 3 February 1877.
22 *The Victorian Temperance Pioneer, or Monthly Magazine*, vol. 1, no. 1, August 1851, pp. 10–13.
23 For example, *GM*, 19 June 1877. ‘The unpropitious state of the weather prevented others from attending, for much as total abstainers may advocate the use of cold water inwardly, very few of them care about getting wet jackets’. In October and November 1891, there was a sustained exchange of letters between ‘Water Drinker’ and the Briagolong correspondent in the *Gippsland Times*. In early October a temperance meeting in Sale saw Rev. Roberts of Stratford express regret that the temperance cause in Sale was at such ‘a low ebb’. A useful flow metaphor in itself. Immediately following on was the Briagolong correspondent writing about government support being needed to improve grape cultivation. *GT*, 2 October 1891.
When we are becoming so sensitive to influenza, la grippe, colds, diphtheria, typhoid, it does not look as if the water regime was such a panacea for all evils physical and social as it is professed to be … I fancy the Blackall sands transformed into prosperous vineyards with a population quaffing its wines instead of the sluggish and depressing waters of that chain of waterholes would have done more to revive Stratford physically mentally and socially than the gospel of total abstinence.24

While completely opposing temperance, the Briagolong correspondent still uses imagery that suggests the positivity of abundant flow.

These meanings of positive flow were generally held by Gippslanders, and remain consistent across time.25 In light of this, the flow-altering actions of nineteenth-century Gippslanders can be revisited with a more tolerant eye. The prevailing correlation between constant, moderate flow, wellbeing and progress means that such alterations were in accord with their world view, and therefore perfectly rational. The next section details the ways that the colonial settlers found waterways so in need in improvement.

Water supply

A major problem facing any town or village in the catchment was how to procure a steady supply of clean water that could be reticulated at reasonable cost. For this reason, water frontage to creeks, rivers or swamps was an important advantage that generally outweighed the risk posed by floods. Everyone had tanks to catch rainwater and a lucky few had springs. Otherwise carting was the only way to obtain water, and Frederick Gray complained of how onerous this task was.26

There are multiple attempts at centralised water supply in the catchment in the region. Table 5.2 gives a selected list of towns and their water supply activities.

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24 GT, 9 October 1891. On 14 October 1891, Water Drinker’s reply was published: ‘The fact that “drunkards who take the pledge break it” does not prove the total abstinence party in the wrong, nor have the Stratford people any excuse for drinking the Avon water if that water is known to be unwholesome.’ Water Drinker dislikes the excesses of his abstinence colleagues as much as the Briagolong correspondent. An example of such a person might be Rev. Matthew Barnett, who the Gippsland Times described in 1878 as ‘mad, or injudicious’. GT, 18 March 1878.


26 Letter from Frederick Gray, 24 June 1854, written while working at Lindenow, East Gippsland Historical Society Newsletter, vol. 1, no. 2, p. 3.
Table 5.2: Table of water supply activities.

<table>
<thead>
<tr>
<th>Date</th>
<th>Place</th>
<th>Type of work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1863</td>
<td>Sale</td>
<td>Diversion of Thomson River flow into Flooding Creek</td>
</tr>
<tr>
<td>1875</td>
<td>Rosedale</td>
<td>Pumped from the Latrobe</td>
</tr>
<tr>
<td>1880</td>
<td>Sale</td>
<td>Artesian groundwater supply</td>
</tr>
<tr>
<td>1882</td>
<td>Traralgon</td>
<td>First motion for artesian water. No construction for 25 years</td>
</tr>
<tr>
<td>1882</td>
<td>Maffra</td>
<td>Council first discusses water supply. No construction for 30 years</td>
</tr>
<tr>
<td>1892</td>
<td>Omeo</td>
<td>Livingstone Creek sourced, to reservoir 1 mile from Omeo</td>
</tr>
<tr>
<td>1894</td>
<td>Bairnsdale</td>
<td>Reticulated water supply. Caught up in rural irrigation debate</td>
</tr>
<tr>
<td>1893</td>
<td>Bairnsdale</td>
<td>Construction of Glenaladale Weir</td>
</tr>
<tr>
<td>1900</td>
<td>Warragul</td>
<td>First motion for supply, based on springs. Moved to head of Tarago River in 1906</td>
</tr>
</tbody>
</table>

Note: Water supplies to towns in Narracan Shire are outside the time period.

The first debates about the desirability and viability of a water supply for Sale came in the 1870s, after a period of sustained population growth from land selection and gold exploration. However, the rising population exacerbated the pollution of surface waters. As shown by Haslam in Table 5.1 above, one of the major uses of rivers in Europe was for waste disposal. Colonial Gippslanders used rivers in the same way. Many understood the difference between use of rivers as source and sink, but with the absence of enforceable regulations, water pollution was a normal feature of the catchment.

Much of Gippsland’s economy depended upon the cleansing ability of flow, especially the wool and gold industries. The use of rivers and wetlands to wash sheep prior to shearing was a fundamental part in the cycle of sheep raising. Mining operations relied on river flow to dispose of their tailings. In relation to drinking water supply, the use of rivers as source and sink proved a significant problem. An excellent example comes from ‘Pure Water’, who wrote to the Gippsland Mercury in February 1877. The letter described the clash between polluting activities and water supply, observed when the writer watched a water carrier fill his barrels immediately downstream of where 40 or 50 ‘knights of the anvil and bellows’ were washing themselves:

I called the attention of a gentleman to the scene; he said it was a running stream, not stagnant water. True, the river is running but remarkably slow at this time of year, so much so that it has no chance of getting cleansed before it is dipped up into the casks.
‘Pure Water’ suggested that the water collection point should be 50 yards above or 500 yards below the washing area.\textsuperscript{27} Significantly, there is clear acknowledgement of seasonal variations in flow, and it perfectly illustrates the perceptual differences between running and still waters.

Pure Water’s letter is only one example of the acknowledgement of pollution of surface water.\textsuperscript{28} Much of the debate about Sale’s water supply focused on the split between supporters of a scheme fed from the Thomson River, and those who opposed it because of pollution concerns. Opposing a second attempt in 1885 to revive the Thomson River scheme, the health officer Dr McDonald described Stringer’s Creek, a tributary to the Thomson:

At Walhalla nearly every resident keeps pigs; there are numerous slaughteryards on the steep hills sloping towards the creek, the cesspits are constantly running over, or oozing through the surface … and all this excreta, with the filth from the slaughteryards, where scores of pigs are kept feeding on the offal, also that from the private pigstyes and debris from the crushing plant, flows into the creek which, after running three or four miles though a narrow rock bound channel, empties into the Thomson.\textsuperscript{29}

Given this, the possibility of groundwater as a reliable, clean source became very attractive.

\textsuperscript{27} GM, 5 February 1877.

\textsuperscript{28} Diary of Rev. Bean, 14 December 1848, discussing Sale. ‘I think probably, the water is bad, being either procureable in the neighbourhood out of the morass or the dirty pools in the Creek, or else from the River Thompson at 2 miles distance. These remarks are the result rather of private conversation in both neighbourhoods than my own observation, through somewhat of both.’ Cited in Clark, \textit{The church of our fathers}, p. 35. Also \textit{East Gippsland Historical Society Newsletter}, vol. 2, no. 2, June 1982, report of a trip to Bullumwaal, noting that early Bairnsdale residents feared their water supply from the river would be polluted by stormwater from the cemetery, p. 4; GM, 12 April 1877, editorial; GM, 21 April 1877, letter from HP re diphtheria; GM, 3 May 1877, Maffra Council meeting of 2 May noting the police report received from the superintendent that Timothy O’Sullivan was causing a pollution of a stream at Donnelly’s Creek and requesting council to have the nuisance abated. See also the \textit{Moe Register}, 8 December 1888, for a similar point on thinking about water pollution, drainage and water supply together; GT, 18 March 1891, pollution on the Thomson from George Pruden’s slaughter yard at Wurruk – need to shift the killing pen so that stuff can’t be washed into the river; GT, 18 May 1896, letter about how to deal with pollution of Lake Guthridge by planting eucalypts and willows.

The two men who were instrumental in tapping artesian water for Sale were Samuel Lacey, an engineer, and John August Niemann, a water borer. They were working together from the late 1870s at various sites, including the Airley Run, Kilmany, the Turf Hotel and at the back of Paterson’s Buildings in Raymond St.30

Collectively, these discoveries altered the community debate about water supply. Niemann persuaded the council to allow him to drill for a water supply bore in Macalister St, opposite the Victoria Hall. Unlike the relatively shallow depths at which water had been previously found, this location caused major problems with pipe breakages. He was eventually successful at a depth of 196 feet (59.7 metres). The resulting 10-metre-high water jet was gratifyingly dramatic.31

The artesian water supply was an instant hit.32 The *Gippsland Times* described how an ‘inhoate Spa’ had developed around the site, with ‘many persons’ in town assembling to drink the ‘medicinal’ waters.33 This description gives the soundest evidence for local knowledge about European spa culture and the healing tradition of ‘taking the waters’.34 The paper noted that most townspeople had switched to the artesian supply, despite its sulphurous odour. ‘Medical authorities’, reported the paper, ‘state that the artesian water possesses eminently hygienic qualities and several citizens may be seen with their glasses in hand every morning taking some early draughts of a liquid they confidently believe to be as good as Apollinaris or Friedriebshal water.’35 It is unclear on what basis the medical claims were made, given that in the same issue council’s resolution to send water to Melbourne for analysis was recorded. Clearly though, nasally challenged residents needed no convincing by external authorities. To contain the flow, the council approved the erection of four 400-gallon tanks while the overflow would be piped to various gutters to

30 For locations of the boring, see Synan, *Precious water*, p. 2; *GT*, 1 April 1881, which notes that Niemann was boring at Kilmany Park; JL Cafiso, *A Niemann family history*, the author and EH Niemann, Morwell, 1986; and SL Lacey, *Laceys Of Gippsland: The history of a pioneer firm 1870–1970*, the author, Sale, n.d. There is little agreement between sources of starting dates. Synan in *Precious water* says September 1878, Cafiso says 10 June 1880, but this refers to the work for council and doesn’t acknowledge the first private bore at Patersons. Lacey does not give a date.
32 *GT*, 21 June 1880.
33 *GT*, 3 September 1880.
35 *GT*, 20 August 1880.
cleanse the town drains. It should come as no surprise that soon after this, residents began agitating for the draining of the eastern lagoon, where all the overflow ended up.

For all that colonial Gippslanders understood about the source versus sink aspect of flow, this did not translate into coherent behavioural or institutional change. They kept on merely shifting the problem of their own unsanitary habits, using water’s ability to shift material. Their main perception was on the supposed inexhaustibility of the ground water supply, unlike the sluggish and polluted surface water streams in the summer.

Flow-dependent industries

While everyone accepts the beneficial nature of flowing waters, few devote thought to the intricate interrelationships that flow sustains. These webs of water sustained most economic activities but were only the subject of explicit discussion in the public realm when those webs were disrupted. In this section, I illustrate the economic connections that flow sustained, using the little-known tanning industry as an example. While gold mining would have also been an excellent example, its water dependencies have been well covered.36

The tanning trade lived off, and lived with, other parts of the rural economy. Its foundation was pastoralism, but tanning also had links with the mercantile world of tradesmen who turned leather into saleable goods like shoes and saddles. Tanners relied on tannin from bark, and bark stripping and carting formed an important source of supplementary income for many settlers, especially those eking out a living on the agriculturally marginal soils next to the Lakes. Both George Auchterlonie and Duncan Johnston recorded stripping and carting in their diaries.

36 For a discussion of their impact on water resources, see D Garden, ‘Catalyst or cataclysm? Gold mining and the environment’, *Victorian Historical Journal*, vol. 72, no. 1, 2001, pp. 28–44; and MM Tracey, ‘No water, no gold: Applied hydrology in nineteenth century gold mining’, *Australasian Mining History Conference 1996*, University of Melbourne, Melbourne, pp. 76–84.
The process used by all tanners (until the introduction of mineral tanning at the very end of the nineteenth century) was vegetable tanning, first developed by the Egyptians and the Hebrews around 4,000 BC. Leather is created when the middle layer of the skin of the dead animal is treated to reduce its water content and strengthen the chemical bonds of the dermis. In Australia, the source of tannin was principally from wattle bark, a commodity that the Gippsland Lakes was richly endowed with: *Acacia mearnsii* was a common plant around the Gippsland Lakes.

Its habitat was described in the 1878 Wattle Bark Board of Inquiry as ‘growing in most parts of the colony, covering large areas in the neighbourhood of the seaboard and contiguous to rivers, creeks and marshes, also in gullies and ravines’. This indicates a much wider range than Gippsland, but its preference for wet feet made Gippsland a place of reliable supply.

38 ‘Fresh hides contain between 60 and 70 water by weight and 30 to 35 percent protein. About 85% of this protein is collagen, a fibrous protein that is held together by chemical bonds. Basically leather making is the science of using acids, bases, salts, enzymes and tannins to dissolve fats and non fibrous proteins and strengthen the bonds between collagen fibres,’ *The New Encyclopaedia Britannica*, p. 225.
As early as 1814, reports were being made to the colonial administrators about the superior tanning qualities of wattle bark, and recommending its export. However, it was not until much later that the properties of the bark were widely appreciated and it became a valuable commodity. Its ubiquity was a financial saviour to many selectors. As clearing was a condition of gaining title to selected land, the presence of *Acacia mearnsii* helped new arrivals by providing an unanticipated source of income. Selectors were able to get some measure of economic return for the hard work of clearing, and they could access extensive Crown lands to cut bark to supplement incomes during low times of year. It provided employment for the carters, men who had small boats that drew little water and that could access the lake and riverside places where the cutters were working.

Tanneries, which processed the skins of the slaughtered animals, were absolutely water dependent. The Longford operation was on the banks of Long Waterhole. Jackson's tannery at Bairnsdale dating from 1876 was located on the banks of the Mitchell, notably off the rise that the main town was situated on. Paul Cansick started the Rosedale Tannery in 1868; Werner and Klux traded in skins and other related products such as fat and tallow in Sale; John Lloyd operated at Wurruk; Henry France's operations were at Heyfield; and the partnership operation between Alphonse Ducret (tanner), John Fitzpatrick (blacksmith) and James Keneally (furrier) was based in Stratford on the Avon River. There were other tanneries at Prospect, Tarravarille, Traralgon, Lucknow and Port Albert.

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40 Searle, *The rise and demise of the black wattle bark industry*, p. 3.
44 *Traralgon and District Historical Society Bi Monthly Bulletin*, vol. 6, no. 1, March 1975, Memoirs of W Power of Carrajung; doesn't supply a date but says early days of Carrajung was GD Clark, who had two properties called Richmond Vale and Top Camp at Carrajung and had a tannery at Richmond. *Traralgon and District Historical Society Bi Monthly Bulletin*, vol. 7, no. 1, March 1976, Walter West's history of Traralgon: At the November 1880 meeting of Council an application from Mr Whalley to erect a tannery on Traralgon Creek was approved. See also Porter, *Bairnsdale*, p. 36; Synan, *Gippsland's lucky city*, p. 72; J Adams, *Path among the years: History of Shire of Bairnsdale*, Bairnsdale Shire Council, Bairnsdale, 1987, p. 88; J Adams, *From these beginnings: History of the Shire of Alberton (Victoria)*, Alberton Shire Council, Yarram, 1990, p. 29; and M Fletcher, *Avon to the Alps: A history of the Shire of Avon*, Shire of Avon, Stratford, 1988, p. 69.
The processes involved explain the uniform choice of location besides water. The first step was to dehydrate the skin so that it would not decompose before reaching the tannery. Second, the hide would be rehydrated and dehaired. According to the *Blackwell Encyclopaedia of Industrial Archaeology*, a tannery undertook this by suspending hides in pits of lime solution. Lime was available locally in Dutson. The lime loosens the hair in the hair follicle so that a worker could scrape it off. Suppleness of the skin was achieved by massaging in infusions of animal manure. After this, the hides were suspended again in pits of tanning liquor. Hides were swapped into vats of increasing strength of tannic acid, which acts on the collagen of the hide as a sort of combined glue and water expellant.⁴⁵

This outline of the technicalities of turning animal skin into leather illustrates why the tanning trade was both dependent upon water, and considered to be an offensive industry. Much of the processing requires soaking in various solutions of different strengths, hence a reliable water supply was critical. It also required somewhere to dump the spent process liquors. The smell, especially in summer, of rotting bits of flesh, fat and hair, would hardly have made the tanners ideal neighbours. Porter wrote of Jackson’s Tannery that ‘exhalations from the tannery were an addition to the town’s medley of unfragrant odours – slaughter houses, drains, cesspits and hoofs singed in the smithies’.⁴⁶

The tanning trade connected the hydrological cycle with selectors, shipping companies, exporters, pastoralists, lime workers, slaughterers and butchers, and a variety of trades that needed leather such as bootmakers. They depended on flow, from the flow of water raised by capillary action inside the stems of *Acacia mearnsii* to the flow of water beside riverside tanneries. Any diminution of that flow affected the region’s economic prosperity.

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Improving flow

Realising their dependency on surface flowing waters, and coming from a culture that continually praised permanent flow, colonial Gippslanders found themselves in a place with unparalleled opportunities to reshape local hydrology. Except for the migrants who came from relatively unchanged northern Scotland, no settler would have seen an unaltered, wild river before.

Gippsland’s rivers were sinuous, high banked with thick fringing vegetation, and associated with large swamps and morasses towards their end as they emptied into the three lakes. In 1864, Rawlinson described the riparian vegetation of Gippsland’s rivers as ‘generally densely grown with eucalypt and mimosa, varying from the ordinary size of forest trees up to that of the largest dimension of forest and scrub’. He emphasised the steepness of the banks, excepting only the small courses of the Latrobe and Thomson in the flattest parts of the Latrobe Valley.

Figure 5.4: Livingstone Creek, below Omeo, illustrating the steepness of banks.
Source: Author.

47 GT, 15 July 1864, correspondence to the editor from TE Rawlinson.
The following section details some key ways that settlers responded to the nature of Gippsland’s rivers, and attempted to improve them.
Crossing points and bridges

On 28 November 1845, the Port Phillip Herald optimistically announced the discovery of a track from Gippsland to Westernport ‘in which there was not a single creek to cross’. John Gellion’s 1844 experience, cited in the epigraph, puts the importance of such a claim into perspective. Gippsland’s rivers already had a fearful reputation. Getting safely across creeks and rivers was a combination of luck, favourable conditions and skill. Without all three, people and animals died.

In the absence of the kind of divine intervention offered to Moses, finding a safe crossing point was vital for the earliest arrivals. Their location represented the best amateur reckoning of factors such as current, bottom conditions and depth.

Figure 5.7: Crossing place at Wombat Creek, Thomas Henry Armstrong Bishop, n.d. Buckley recorded a log crossing on 25 February 1849.

Source: Pictures Collection, State Library Victoria, Accession no. H40967.

48 For another example of a near miss, David Parry-Okeden saved the life of his stockman while trying to cross the Mitchell. The stockman’s horse had gotten into a hole and he had fallen off. There is no mention of whether the horse survived. D Parry-Okeden, ‘The Parry Okeden family at Rosedale’, Gippsland Heritage Journal, vol. 10, 1991, p. 46.
When money became available for bridges, the reckoning expanded to include geomorphological conditions suitable to siting good foundations. As technological capacity and capital grew with the century’s age, colonial Gippslanders were increasingly able to ignore the constraints on the travel patterns placed by rivers. They began instead to change the creeks and rivers to suit themselves, rather than accommodate themselves to the rivers.

The ideal crossing point had particular characteristics. Shallowness and a gentle current was highly desirable, combined with low sloping banks and a firm, clear bottom. It was also located near a suitable place for a homestead and good fertile soil. Alluvial soils dictated the spread of early pastoralists and farmers. The catchment’s rivers did not often produce this combination. Angus McMillan’s record of exploration is marked by long rides upstream from where the rivers emptied into the lakes, to find a safe crossing. Complaints about steep banks, thick scrub and mud mark other accounts. Rev. Bean, one of the earliest Anglican clergy who spent most of his time travelling, wrote in 1849:

"After taking some refreshment at Mr Okeden’s that gentlemen road with me to a ford opposite to Mr Hobson’s [Fulham] where we both crossed after some difficulty; the rivers of Gippsland being by no means easy to ford or cross, the banks being general steep and the rivers deep. The Avon is the only that appears not so."

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49 Diary of Patrick Coady Buckley, 4 November 1847, ‘removed from the old hut near the crossing place on the south side of Merriman’s Creek where I first sat down in 1843 to the new place’. See GT, 6 June 1881, for a reference to the shallowness of a crossing on the Tambo river and the footbridge over it, located next to Peter McDougald’s inn providing a resting place for travellers.

50 For example, letter from Edward Hobson to his wife Mary, dated 7 October 1847, ‘The country is by no means an interesting one, being very thickly timbered except on the banks of the rivers where the plains are extensive and exceedingly rich. On my run I could plough 1000 acres of the richest soil in the world without cutting down a tree’, in J Court, From squatters hut to city, Traralgon, 1840–1976, City of Traralgon, Traralgon, 1976, p. 19; ‘The [Maffra] district originally consisted of alluvial plains and river flats – the plains nearly treeless, and the latter have the usual fringe of timber along the Thompson and Macallister rivers, and around the edges of the numerous creeks. Most of the land surrounding being of a rich quality was taken up under the Brooks and Nicholson Land Acts …’, Middleton and Manning’s Directory, 1884; Evidence of Alfred E Otter, selector at Lake Victoria, cited in JM Powell, Yeoman and bureaucrats: The Victorian Crown Lands Commission 1878–9, Oxford University Press, Melbourne, 1973, p. 366. Real estate advertising also highlights alluvial soils, e.g. the opening quote of this chapter and similar, such as GM, 5 April 1877, re Denis Connolly’s runs at Dargo; GT, 1 March 1870 and 1 April 1897.

51 Diary of Rev. Bean, 29 January 1849, cited in Clark, The church of our fathers, p. 45. See also Diary of Patrick Coady Buckley, 6 February 1844, ‘Made several attempts to cross the Morwell but could not on account of the banks being so steep’. 

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McMillan concurred with Bean and settled on the Avon. The crossing place he chose between Boisdale and Bushy Park on the Avon met with the approval of at least two diarists. Elizabeth Montgomery described it as:

> The water was about two feet deep and the approach from our side was across a stretch of lovely flat stones, then came the clear brown water running over a bed of many coloured pebbles and the opposite side was of white sand. Both banks were shaded by wattles, tea trees and other scrubs with a dense undergrowth of tussocks and ferns.52

This is in stark contrast to how Alick Hunter described a crossing on the Macalister as ‘beastly, ‘deep’ and ‘muddy’.53 One of the most graphic descriptions of a near disaster at a crossing place was given in a letter by John Gellion in 1844, author of the second epigraph. After eight days of rain, his stock refused to cross at Hobson’s Crossing. They decided to attempt shifting their belongings across:

> It came on a dreadful storm of hail and wind, which raised the river to an enormous height. It was now approaching dark, and Billy Lonsdale told us that if we did not leave we should loose all our baggage, and probably our lives … Having got the things over and placed on the opposite bank, our next business was to get them secured, but before we had time to do this the water came flowing in and in less than half an hour we were knee deep in water, and all our things covered.54

Possibly no one had a worse time with crossings than Joe Daniel, who was collecting statistics in the Dargo area in 1871. He had to cross the ‘the Wonnangatta alone 180 times’ and gave up tracking his crossings on the Crooked and Wonnangarra rivers.55 More commonly, troubles at crossing places merely meant lost time and aggravation – for example, Duncan Johnston got stuck crossing the Tambo with a loaded dray of wood. He had to unload, release the dray, split the load and make two trips. In another accident, his horse fell over the precipice at St Patrick’s Creek.56

52 Quoted in Fletcher, *Avon to the Alps*, p. 19.
56 Diary of Duncan Johnston, 15 December 1882, for getting stuck and 6 August 1882, for the horse.
The characteristics of flow did more than just determine how people travelled through the landscape. Flow also influenced where they settled. The actions of Archibald McIntosh illustrate this. McIntosh, an engineer turned blacksmith, was the first settler at Flooding Creek (later renamed Sale), probably in 1844. His shop was on the banks of the creek, adjacent to the track that led to the punt over the Latrobe River. McIntosh gambled that the location would become important following the construction of the punt. He was right. Bairnsdale was created similarly, around the punt that replaced the canoe used by travellers to cross the Mitchell River. Much of Adam’s story of the early history of Narracan Shire, which comprised the early settlements around Moe, conforms to this pattern. A safe(ish) crossing place led to a hut or inn, which then might lead to a bridge, around which a village would grow.

As the population grew, crossing points were no longer sufficient. Bridges were needed, both within Gippsland and linking Gippsland to Melbourne. The main road to Melbourne was always a subject of debate. Gippslanders were perhaps no more or less argumentative than any other group in the nineteenth century; however, one cannot help but be impressed (or is that exhausted?) by the amount of arguing about bridges recorded in the papers. Fighting could take place about whether to build one, where to build one, what materials to use, what design it should be built to, the expense and how to maintain one. In the previous chapter, I used as evidence for the impact of rain a comment made by Miss Caughey in her diary. She hoped that all the hard work spent preparing for a ‘picnic’ would not be wasted if it rained. This picnic was much more than a light-hearted social gathering. The real reason for the picnic was that Traralgon Shire councillors and staff were on a site visit.

57 Synan, *Gippsland’s lucky city*, pp. 23–5. Apparently McIntosh called it Flooding Creek, although Synan says that in normal rainfall it was more like a chain of billabongs. McIntosh arrived in Gippsland in 1841 with the laird Glengarry, bringing his sisters and his son with him. McIntosh bought Glengarry’s plant when he failed and moved to Nuntin Station, staying approximately two years. There was the suggestion is that he left Nuntin because he was sick of the flooding on the Avon River, but removal to Flooding Creek doesn’t suggest that being inundated was a issue for McIntosh.


59 For example, ‘Gippsland and its resources, by a correspondent’, *Argus*, 3 May 1864. ‘A few inquiries respecting the bridges on the main road to Gipps Land would not be out place in the Legislative Assembly … No same man could have expected that bridges built of logs simply resting upon sandy banks of mountain torrents could possibly endure for a longer period than the interval between the time of their erection and the occurrence of the first flood afterward.’
inspecting possible bridge sites across the Latrobe River. The Caugheys had a vested interest in the site that was closest to their holdings, and part of the purpose of the picnic was to persuade council to their own interests.

The Caugheys were by no means unusual in their attempt to influence the outcome of a bridge’s location. Negotiations about bridges could take years to resolve, especially when the bridge crossed a river that formed a boundary with a neighbouring shire. This doubled the amount of confusion and wrangling. The Traralgon correspondent for the *Gippsland Times* was pleasantly understated when s/he wrote in 1881:

> Are we really at last to have bridge over the Traralgon Ck? Hurrah! Not before it is wanted certainly. There has been a little difference of opinion as to site. A public meeting was called to protest against the action taken by Council but it failed in its object, and now that everybody has had their say, and no serious objection has been raised to the proposed site it is hoped that all bickering and ill feeling will be at an end …We ought not to put anything in the way of its being built, for the old bridge is very shakey, and may come down during any flood time, and this would cut off a large business from the township, and consequently stop money from coming in – which would be a calamity to be deplored. ⁶⁰

Rarely were the links between water flow and cash flow so plainly put.

Engineering reports to the council meetings illustrate how much of community time and money was devoted to roads, crossing places and bridges. In fact, Adams suggests that roadmaking was the main reason why the Narracan shire was formed. ⁶¹ For example, the *Gippsland Times* reported on 28 January 1875 that the Avon Shire had four water management related contracts for tender: 26 chains of draining and filling and three culverts on the road past Kee’s to Nuntin Creek, 30 chains draining on the road to Bundalaguah common, a bridge across the creek between Clarkes and Clements at Upper Maffra and a bridge

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⁶⁰ *GT*, 9 February 1881.
⁶¹ Adams, *So tall the trees*, p. 85. According to Daley, the causeway was constructed at Longford in 1856, followed shortly by a timber bridge. C. Daley, *The story of Gippsland*, Whitcombe & Tombs for the Gippsland Municipalities Association, Melbourne, 1960, p. 44. Construction of the first bridge over the Mitchell was started in 1870, on the site of the punt. A bridge over the ‘Backwater’ had been built in 1868 by John McLaren. Daley, *Story of Gippsland*, p. 51. See also Fletcher, *Avon to the Alps*, p. 58, on the long history of the Avon bridge, first built in 1854; survived floods of 1865 and 1866 but not the one in 1870; temporary punt and bridge started again until new bridge erected in 1874; extensive damage again in floods of 1878 and 1879, and the shire sought government help for repairs; narrowly survived 1891 flood but only due to efforts of volunteers.
and approach near Browns, on Crooked River Rd. The Rosedale Shire advertised four contracts: construction of Log Ford at Morwell Swamp on the main Melbourne road, a log bridge and approaches at Waterhole Creek (also on the main Melbourne road west of Joe Smith’s), a timber bridge over the Latrobe to the north-east of Traralgon, and 60 chains of draining on the upper main side of the road at Loy Yang.\textsuperscript{62} These tenders, and the multitude of others, are part of a collective attempt by local communities to render the hydrological features of the catchment invisible to traffic.

There were times, though, when this invisibility was an impossible fiction. The importance of bridges was highlighted by the actions undertaken by volunteers to save them during floods. The major flood that struck Sale on 26 March 1870 saw surveyor William Dawson, policeman John Sadleir and at least three other men spend hours in the dangerous work of attempting to deflect or hoist out debris pushing at the piles of the Cunninghame St bridge.\textsuperscript{63} The regular public calls for adequate maintenance, such as the following about Flinn’s Creek only a month before the above mentioned flood, show that at least some commentators appreciated that the hydrological cycle still had the upper hand:

The bridge across Flinn’s Creek is at present in a most dangerous condition. The logs of which the flooring consists are little else than a series of pitfalls through which the feet of passing horses are liable to slip at any moment, and in addition the ‘structure’ is so shaky that a wavy motion is distinctly perceptible when the coach crosses it. It is feared that the first flood will deprive us of this means of crossing, and steps should therefore be taken to make the bridge secure.\textsuperscript{64}

By spanning actual flowing water, bridges facilitated the flow of people, products and cash. The Traralgon correspondent was recognising what economists call deprival value. The real value of an asset like a bridge goes beyond the value of its construction. It’s what a bridge facilitates that

\textsuperscript{62} There is a multitude of other calls for tenders, or reports of debates in council in the paper. Other examples include the advertisement in \textit{GT}, 11 March 1881, of a notice of motion in Maffra Shire to raise a loan for £6,000 over 15 projects, of which six were related to crossing or managing water and road making, i.e. two stone fords to be made over the Avon River, draining roads, bridges – each ford worth £500; £400 for draining main road between Stratford and Maffra; £1,000 for draining and forming roads between Maffra, upper Maffra and Newry. See \textit{GT}, 4 February 1881, 25 April 1881 and 23 July 1886.

\textsuperscript{63} \textit{GT}, 26 March 1870.

\textsuperscript{64} \textit{GT}, 1 March 1870; \textit{GT}, 4 January 1876, Rosedale correspondent.
should be valued as well, not just the structure itself.\textsuperscript{65} The destruction of bridges caused major impacts for a council’s budget. In 1891, a flood along the Avon made immediate repairs necessary to no less than 10 bridges or crossing points.\textsuperscript{66}

Of all the bridges ever constructed in Gippsland, perhaps Sale’s swing bridge encapsulates both the barrier and opportunity that flowing waters meant to colonial Gippslanders.

The swing bridge was constructed over the Latrobe River in the early 1880s and connected Sale and South Gippsland. However, the need for a bridge at this critical location posed a substantial problem. Gippslanders relied equally upon marine trade, and a bridge would cut access to any commercial-sized steamer: one kind of flow would stop another.

Unwilling to accept this, Gippslanders designed a variant of an opening bridge, of which London Bridge with its hoisting decks is perhaps the best known. In this case, the swing bridge pivots on a central pillar, which sits in the middle of the river. At the approach of a steamer, the operator detached the bridge platform from its anchors on the bank, and swivelled it 90 degrees so that the whole deck sat parallel to the river banks, allowing steamers passage on either side. The bridge opened to traffic on 22 September 1883.\textsuperscript{67}

\textsuperscript{65} D Brunckhorst, ‘Understanding design for planning alternative landscape futures to adapt to climate change: Learning from temporal inconsistencies in vulnerability and adaptation studies’, Paper delivered at the 1st International Conference on Adapting to Climate Change: Preparing for the unavoidable impacts of climate change, Gold Coast, Australia, 29 June – 1 July 2010.

\textsuperscript{66} GT, 11 September 1891. At the Maffra Shire meeting of 9 September, the engineer reported: ‘Since the last meeting of council the flood waters have subsided and a more careful inspection of the actual damage done has been made'; Hagan’s bridge was destroyed, recommends a new site be chosen; temporary ford set up on the property of the late James Boland; at Glenmaggie the culvert washed away, recommends a pitched stone crossing instead: ‘the Glenmaggie Creek at Gleeson’s is now twice its original width, and the bridge is standing in mid stream, with approaches washed away’, same for Manley bridge at Tinamba and Andersons Creek; Coombs bridge will need a new span and strengthening; Newry footbridge gone; crossing at Valencia Ck completely gone, Mayhews culvert gone, approaches to Avon bridge gone, temporary punt installed at Bushy Park.

\textsuperscript{67} Synan recounts how plans for the opening celebration were eclipsed by the dying wish of John Campbell. Campbell had lost the partial use of one of his hands during the flood of February 1863. Despite his disability, he continued to contribute to rescue efforts. No one therefore wanted to deny him his dying wish to be the first person to cross the Sale Swing Bridge. P Synan, \textit{Highways of water: How shipping on the Lakes shaped Gippsland}, Landmark Press, Drouin, 1989, p. 65.
Figure 5.8: The Sale Swing Bridge, showing the central piers around which the deck pivots.  
Source: Author.

Figure 5.9: Looking upstream from the Sale Swing Bridge at the new, and substantially higher, Latrobe River bridge.  
Source: Author.
Removing obstructions to shipping

The Sale Swing Bridge was only one part of a much wider vision to remake the lakes and rivers of Gippsland to facilitate the flow of people and products. This vision was developed by Sir John Coode, who had been contracted by the Victorian Government to review the existing entrance works and advise on the best way to make the lakes permanently open to trade. His scheme, enthusiastically adopted by the Sale Council and a range of other supporters, included a canal to link the town to the Thomson River and a comprehensive program of desnagging rivers and dredging their mouths to facilitate access to ports at Sale and Bairnsdale, the main distribution points. The creation of the permanent entrance was merely a much more substantial application of the same principle.

The desire for permanence and order was always particularly focused around estuarine systems. Horton and Eichenbaum provide the most memorable reason why:

The … collision of sweet and salt – fresh river water flowing seaward and ocean pushing inward – makes what we call an estuary. The Latin verb aestuare – to heave, boil, be in commotion – gives fair warning that that this place is no mere river running in one direction for all time. Nor is it a lie, its waters turning over sedately once or twice a year as the surface layers cool and warm. Neither does it feature the predictable currents and constant salty chemistry of the oceans. Estuaries in their behaviour are among liveliest natural systems of the planet. They are the aquatic world’s three ring circus of motion, productivity and changeableness.68

The reengineering of rivers and estuaries was hardly a pioneering departure.69 Colonial Gippslanders were merely following a well-established European, and then American, precedent. British rivers have been regulated since the first century AD, when the Romans started land drainage and navigation improvements. By 1086, there were approximately 5,000 watermills, growing

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69 Substantial reengineering also took place in the gold industry. For example, East Gippsland Historical Society Newsletter, vol. 2, no. 4, December 1982, Trip to Deptford at Pub Gully, ‘a walk through the bush along the riverbank brought them to the tunnel dug under the river bank to divert the flow of water, said to have been dug by hardworking Chinese miners’, p. 8.
by 1800 to approximately 12,000. Waterwheels were also employed in Gippsland – for example, in 1855 Frederick Gray noted that his employer had a watermill that was used to grind a few bags of wheat a day.

Figure 5.10: Oriental claims area, near Omeo.
Source: Author.

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70 S Owen, C Pooley, A Folkard, G Clark & N Watson, *Rivers and the British landscape*, Carnegie Publishing, Lancaster, 2005, p. 28. The Thames had a waterwheel on average every 3 kilometres during medieval times. Small two horsepower Saxon-style waterwheels (placed horizontally in the water) could do the work of 30 people using hand mills, and had the added advantage of not needing extra land to grow fodder for horses. Vertical wheels were a later development that could be made more powerful through constructing a weir and a flume, which allowed a more constant and steady flow of water to turn the wheel. For the 1800 figure, see pp. 104–5.

Snagging and dredging were the preparatory steps to facilitating major shipping trade on the lakes system. These practices ironed out, so to speak, some of the variability inherent in natural river systems, such as how Rawlinson described the upper Tambo in 1864 as alternating shallow gravels and deep pools.72 The Tambo’s upper reaches, like many of the gold-bearing alpine rivers, would be seriously altered by mining practices like sluicing. Figure 5.11 shows the visible effects of sluicing near Omeo.

Unlike gold mining activities, which leave clear evidence of human activity, snagging and dredging cannot be seen. Snagging refers to the practice of removing submerged logs and vegetation to improve navigation. For aquatic biodiversity, snagging obliterates habitat. Dredging refers to artificially deepening channels. Its ecological impacts are also destructive, both for the species in the area dredged and for those where the spoil is dumped. At the same time snagging was carried out, banks were also frequently cleared of riparian vegetation, leading to significant bank slump, and exacerbating wider landscape-scale changes in erosion and sedimentation rates.73

A lengthy report from May 1881 on the progress of the snagging contract in the Latrobe River highlights the changes made:

The river has to be cleared of snags to a depth of 9 feet below summer level, and overhanging trees on both sides of the stream cut away for a distance of ten feet … Some of the snags fished out are giants, 40 to 90 feet in length, and five or six feet in diameter.

The report noted how the snags formed habitat for eels, but highlighted the efficiency of the contractor and his block and tackle equipment, and how the works were speeding the progress of Sale.74 The Tambo was extensively snagged, as was the Mitchell.75

The Avon became a textbook case in how the removal of riparian vegetation exacerbated erosion. The now bare banks of the rivers increased the susceptibility of the banks to erosion.76

72  GT, 15 July 1864.
74  GT, 4 May 1881.
75  For positive reports on this, see Middleton and Manning’s Directory, 1884, entry for Bruthen; and Our Trip to the Gippsland Lakes, by the Publishers, an advertorial for the Lakes Navigation Co. in Middleton and Manning’s Directory, 1884, pp. 15–17.
5. ‘FAIR STREAMS WERE PALSIED IN THEIR ONWARD COURSE’

Figure 5.11: Bank erosion on the Avon River, 1872.
Source: Pictures Collection, State Library Victoria, Accession no. H40967.

Figure 5.12: Washaway at bridge over Avon River near Bushy Park, Victorian Railways, 1893.
Source: Pictures Collection, State Library Victoria, Accession no. H1077.
Ironically, this would lodge more sediment on the bar, which would then need dredging, thus locking settlers into a repeating cycle. By the mid-1940s, the Avon was reported as the most eroded river in Victoria.77 The crossing that Elizabeth Montgomery once admired on the Avon was only a few feet wide. By the time Charles Daley published *The Story of Gippsland* in 1960, the bridge spanned 380 feet.78 The change in the Avon was evident from as early as 1882, noted when a journalist visited Boisdale to write a story.79 By 1897, the river was so changed that the railway bridge no longer spanned the river.80 Severe erosion along the Mitchell was also reported in the 1890s. Bairnsdale Shire Council, with no apparent sense of irony, sought permission to use the dredgings from the mouth to fill the washaways.81

The supply of sediment from the catchment built bars at the river mouths, and this natural process was exacerbated by clearing in the catchment. A study carried out in 1998 suggested that deposition rates of sediment were approximately twice pre-European rates.82 The need to dredge was exacerbated through low rainfall periods, as water levels dropped. In January 1881, the steamer Murray was stuck for several days on the bank at the mouth of the Mitchell. Shipping companies were refusing heavy freight as a result.83

The location of the dredge was yet another arena for jealousy and rivalry between the councils of Sale and Bairnsdale.84 Ship groundings or near misses were by no means rare, and such incidences were generally used to make an argument to the government for more funding of some kind.85

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80 *GT*, 1 July 1897.
81 *GT*, 7 December 1896. Permission was refused by the Inspector General of Public Works on the grounds that silt was unsuitable, and that the government had no interest in protecting freehold land.
82 RB Grayson, C Kenyon, BL Finlayson & CJ Gippel, ‘Bathymetric and core analysis of the Latrobe River delta to assist in catchment management’, *Journal of Environmental Management*, vol. 52, 1998, p. 370. doi.org/10.1006/jema.1998.0181. The study also noted that while sedimentation was less than previously thought, the fine nature of the sediment made it easy to transport high levels of nutrients.
83 *GT*, 19 January 1881.
84 *GT*, 19 January 1881.
85 For example, *GT*, 18 April 1876 and 1 April 1891.
From virtually the moment white settlers arrived, they argued continuously about the best way to facilitate transport through the region. The difficulty of road travel, nicely symbolised by the three abandoned attempts of the first Crown Lands Commissioner, Charles Tyers, to reach his new post from Melbourne, fuelled discussion of the various merits of road, rail and ship. To date, these have been understood by many historians to have been in opposition to each other. However, both the lobbyists for the permanent entrance and the lobbyists for rail were in perfect agreement on the fundamentals. Underlying both campaigns was an argument based on metaphorical flow. No one in Gippsland disagreed with the idea that people and goods should be able to flow swiftly and unimpeded to Melbourne, and then outwards into the imperial economy. Their disagreement revolved around the mode of conquering the vagaries of flowing water. J Rodgers of Greendale in North Gippsland argued for both, in a hyperbolic poem published by the *Gippsland Times* in 1881. The first three stanzas elaborate on the silent, primitive wilderness, complete with unclothed ‘tawny native’, before launching into a rallying cry for progress via rail and ship:
Be ours, a free unfettered Press, the Plough, the Rail.
Ah yes! The Rail! Prepare the iron way,
Tear up the rock, prostrate the wood,
Drive through the mountain, and make no stay
For Thomson, M’Allister or Latrobe.
Lay the long rail across the verdant green
And wake to roar and echo of whirling wheel and steam.

Remove the sand bar! Open Gippsland to the world!

…

Gippsland will yet arouse from its slumbers
And become the most flourishing spot of Victoria
We have the land, the beautiful sparkling streams
Coupled with magnificent climate.
Its with God’s blessing &c. What can we want more?86

Rodgers was not the first or last to write truly awful poetry about Gippsland, and nor was s/he the first to advocate for opening the entrance. From as early as 1846, colonial settlers were trying to regularise the estuarine entrance. Mary Cunninghame wrote about how flow variability was impacting on her life, demonstrating how, after only eight years of colonisation, the preference for moderate flow was set:

Owing to very heave rains great parts of Gipps Land is flooded this spring and it has been alarming increased by the outlet of the Lakes into the sea being closed by a large sand bank, after waiting and hoping that the water would force its own way out Boyd and my brother determined to go down to the Entrance to see if they could force a passage, fortunately a few days before Boyd had exchanged a couple of horses for a good sized boat which is indispensable where there is so much water carriage – Accordingly they were able to go without danger the distance being nearly fifty miles – They cut a passage through the bank of twenty feet long and about ten deep – and now we are anxiously waiting for the waters to subside, as they are doing much injury to the grass, the country being for miles under water.87

86 GT, 7 September 1881.

Patrick Coady Buckley also hand-cut entrances at smaller creeks that emptied out into the sea on his various runs, and there are occasional references to cutting bars at Prospect in the late 1890s, when it became a favourite camping and holiday place. GT, 14 January 1897 and 4 November 1897.
The previous quote illustrates precisely what the authors of the Gippsland Lakes Environmental Audit described in more measured academic language in October 1998:

Before the opening of the Entrance in 1889, the Lakes were a series of coastal lagoons that only opened to the sea after heavy rainfall and runoff from the major catchments … The level of the lakes would have fluctuated markedly after rainfall, with the level rising and inundating the freshwater marshes around the open water areas before the flow through the opening scoured out enough sand to lower the level again.88

The authors went on to note that it was an almost entirely freshwater system, and that the country that Mary Cunninghame thought was being ‘injured’ was actually dependent upon such periods of inundation.

Investigations into the nature of the bar at the entrance commenced early. Kirsopp, on a coastal charting expedition in 1841, reported that there was no permanent entrance. Squatter John Reeves visited the entrance in 1842 and, shortly after, he took a larger party including the Port Albert harbour master for a closer inspection. They concluded that the entrance was unsafe.89

The year 1844 was dry. With insufficient flow, the entrance did not open at all. It reopened by the time Smythe made a survey in 1849, but rarely opened during the 1850s. After noting the damage that floods were causing, a la Mary Cunninghame, surveyor WT Dawson proposed a scheme to cut a 60-mile-long canal to Port Albert.90 The real turn in fortune for lakes transit advocates came in 1858. First, Phillip McArdell took advantage of a flood to float the Enterprise, his purpose-built lakes trader boat, across inundated flats, around the low bridge at Longford and into the Lakes.91 Second, on 23 April 1858 Malcolm Campbell successfully navigated the Georgina Smith, his schooner with a draught of 7 feet 6 inches, through the entrance and almost to Bruthen with

90  Bird & Lennon, Making an entrance, p. 8.
91  Morgan, The literature of Gippsland, p. 89.
cargo for the Omeo goldfields. Support for a lakes entrance scheme was instantly won from all the gold districts in the catchment, suffering under the crippling costs of road freight.\textsuperscript{92}

Campbell’s success fostered much more interest in the possibility of a permanent entrance. It also coincided with a run of wet years, which kept the entrance open and relatively navigable. With a growing population in the gold districts, and the arrival of selectors, the potency of the idea took hold.

Given that just about every history of Gippsland recounts this story, it is not the intent here to recount the minutiae of the claims, counter claims, petitions, tenders or works. Rather, I highlight the intent to create permanence, order and moderation in nature. This was not an option available when it came to rainfall, as Chapter 4 demonstrated. Weather vagaries were always commented upon, and sometimes even with a flow metaphor:

\begin{quote}
   The old saying ‘As changeable as the weather’ has been exemplified here last week. The heat of Thursday and Friday was such as Queensland could not excel. It was so intense on Friday that it roasted the ferns at Sandy Creek. A welcome change set in on Saturday evening; the rain came down in torrents, and it really looked at one time as if the flood gates of heaven had opened up. Let us hope that they will continue to flow, for never was Gippsland, at least this part of it, more in need of rain than at present.\textsuperscript{93}
\end{quote}

In the face of such changeableness, regularising flow meant exerting control. The manipulation of surface water was increasingly an option for nineteenth-century settlers. The construction of a permanent entrance is the apotheosis of this attitude that nature could be corrected.

\textsuperscript{92} KMcD Fairweather, \textit{Time to remember: The history of gold mining on the Tambo and its tributaries}, the author, Doctors Flat, 1975, p. 22. The high cost affected the affordability of food – Fairweather says that Omeo district miners paid the exorbitant sum of 2 shillings and 6 pence for blackberry roots for the pleasure of fresh berries in season, contributing to the widespread weed problem of the next century. Steenhuis suggests that miners around Donnelly’s Creek relied on shooting native fauna such as the lyrebird and wallaby. L Steenhuis, \textit{Donnelly’s Creek: From rush to ruin of a Gippsland mountain goldfield}, Paoletti’s Maps and Videos PL, Lagwarrin, Vic., 2001, p. 15.

\textsuperscript{93} \textit{GT}, 24 February 1886, Stratford correspondent.
Very few gave thought to the possible knock-on effects of the change. Only ‘Tom Cringle’ and John Coode noted that water levels would drop and that it would become more marine. It is doubtful that either of them appreciated the full ramifications. Creating the permanent entrance changed the fundamental nature of the system. The 2003 Ramsar plan for the Lakes lists altered water regimes, salinity, pollution, pest species, resource utilisation, dredging, recreation and tourism, fire and erosion as main risks, although obviously this reflects the full sweep of time rather than just the impacts created by actions in the nineteenth century. As an intermittently closed and open lagoon (ICOL), the Lakes were generally a freshwater system, only becoming salty during periods of breach. They supported a wide variety of plant and animal species that

96 ICOLs can be fresh, brackish or salty. There would also be changes in salinity during drought due to evaporative processes and a reduction of groundwater discharge. Sara Beavis, pers. comm., 30 September 2011.
were adapted to this regime of primarily fresh water. When the system became predominantly marine, all those species slowly died, leading to widespread shoreline erosion.

As Bird notes, it was this gradual change that misled most for decades into thinking that the construction of the entrance was wholly benign. A few years of high rainfall following the opening buffered the freshwater levels. Changes only became obvious just before World War I and became pronounced in the 1920s, both after long periods of drought. Changes included the death of *Melaleuca ericifolia* stands on the lake fringes, the proliferation of eelgrass (*Zostera* spp.) and invasions of marine crabs.¹⁷ Severe eutrophication problems came later in the twentieth century, when farmers began to apply cheap, artificial fertilisers.

Ironically, the attempts to regularise flow only created long-term change and uncertainty for settlers’ descendants. According to Harris et al.:

> The only long term solution is to markedly reduce the nutrient loads from the Latrobe system by both restoring the catchment to a more sustainable land use and by replacing riparian vegetation and reducing erosion. The importance of wetlands, in reducing nutrient loads to the lakes should not be underestimated.⁹⁸

From having energetically tried to remake the catchment, current Gippsland citizens are now attempting to restore the catchment to something more like its situation in the nineteenth century.

**Conclusion**

This chapter has demonstrated that the ideal of permanent, moderate flowing waters was valued across many different aspects of colonial life. Initially, colonial settlers were forced to accommodate themselves to the power of flowing water. However, as wealth and technical capacity grew, they were able to effect significant changes to the hydrological cycle. The ability to make hydrological changes reflects a mathematical and quantitative understanding of hydrology; the common paradigm of the

⁹⁸ Harris et al., *Gippsland lakes environmental audit*, p. i.
nineteenth century. The changes, which included permanent piped water supplies, altering river morphology and the creation of the permanent entrance, were universally regarded as desirable and progressive. The limitations to both a quantitative vision of hydrology and the notion of progress would only become clear generations later.