

Culture and geography: South Australia's mound springs as trade and communication routes*

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One of Australia's most richly patterned trade and communication routes is that associated with the mound springs of northern South Australia. Extending in a great arc for almost five hundred kilometres south and west of Lake Eyre, the springs provided permanent, potable water in an otherwise harsh desert environment. The resultant human activity which has focussed on and been dependent on the springs for many thousands of years brings together in a most evocative and graphic way many of the key themes of this Conference.

An introduction

Artesian springs occur throughout the world, but are particularly prominent in parts of inland Australia. Described from the earliest years of European settlement as 'mound springs', they are natural outlets for the pressurised ground water of the 1.76 million km² Great Artesian Basin, one of the largest of its kind in the world.

Many of the hundreds of springs occurring in the Basin are located along its margins where the water-bearing aquifers abut adjoining basement rocks, although others occur as inliers where tectonism allows the water to escape to the surface along fault lines and through fracture zones.² Since European settlement aquifer drawdown in the wake of bore-sinking has resulted in widespread flow decline and spring extinction. Areas of western and central western Queensland still have many active springs,³ but most in north-western New South Wales are either extinct or reduced to slight flows or seepages.⁴ Northern South Australia now has the most active and numerous springs.

In a landscape context all of the springs are small, with flows varying from seepages to a maximum of around 150 litres per second (L/s) for one of the springs at Dalhousie, an active complex on the margins of the Simpson Desert north-east of Oodnadatta. The estimated flow from all mound springs in Australia is around 1500 L/s, of which 62% is from South Australian springs. The waters vary in temperature from around 20° to 45° C and are relatively high in dissolved solids. In many cases carbonates deposited out of the waters, combined with wind-blown and waterborne sediments, have formed characteristic cones or mounds, hence the popular name mound springs. Individual mounds range from several metres to several tens of metres in diameter and up to several metres in height, but not all springs form mounds; numerous examples emerge at ground level and form only slight depressions or seeps.⁵

In a geological time frame the springs are dynamic, with abundant evidence of cyclic waning, waxing and extinction, but recent work has documented considerable short-term fluctuations in flow.⁶

Indigenous culture

South Australian mound springs occur in some of Australia's most inhospitable country. Surrounded by a succession of sand ridge and stony deserts, the springs country is characterised by extreme annual temperature ranges and low and erratic rainfall. Day temperatures in summer consistently exceed 40°C and annual average rainfall figures are around 120-140 mm. Other than after major rainfall events, the principal drainage lines such as the Peake and Stuart Creeks, and the Margaret, Neales and Macumba rivers are dry or restricted to a series of disconnected brackish ponds.

The only permanent potable water in the region is from the mound springs and they represented an unfailing reserve which could be relied upon when the surface water of the drainage lines or rock holes had failed. The quantity of occupational debris around the large springs clearly attests to their utilitarian importance to indigenous people, with sand dune campsites displaying an almost continuous patina of stone assemblages, animal remains and hearthstones. At the same time, it is known that the relatively poor quality of the mound spring water and sparse plant and animal food resources around the springs encouraged indigenous people to move regularly and travel away from the springs wherever rainfall events allowed.⁷

The need to move within the region was also linked with and complemented by the desire to communicate and trade in goods and ideas with more distant people. With a lineal alignment extending over hundreds of kilometres the springs were an important component in a continent-wide network of indigenous trading and communication routes. In particular, Palthiri Pithi, a grinding stone quarry on Sunny Creek west of Lake Eyre North, was one of a number of major exchange centres throughout the Lake Eyre Basin and its stone blanks were an important contribution to a trading system which extended over thousands of kilometres and involved commodities as diverse as orchre, pituri, bailer shells and a range of stone and wooden implements.⁸

Given their utilitarian importance to indigenous people, it is not surprising that the springs featured prominently in many of the myths and song lines, although with indigenous ritual falling into disuse only decades after initial European occupation of the region much has been lost. That which has been recorded indicates clearly that in Kuyani, Arabana and Wangkangurru tradition the people identified very closely with the springs, individual springs taking on widely varying roles, from simple watering points to locations where important actions or incidents associated with major dreaming cycles took place.⁹

The non-indigenous occupation

Western European imperialism in the nineteenth century assumed that virtually all new countries invaded and occupied were unknown. The moral imperative and economic rationale which followed from that saw explorers regularly set out to 'discover' and map the 'unknown' regions.

In the South Australian colony of the mid-nineteenth century, this resulted in first Benjamin Babbage and then shortly after Peter Warburton 'discovering' the mound springs and dispatching to Adelaide accounts of their geography and possible evolution in the landscape.¹⁰ Springs near Lake Eyre South described and named by

these two in the late 1850s included Emerald, Walcarina, Coward, Strangways, Beresford, Warbuton and Anna, but it was John MacDouall Stuart who was to most fully describe for European benefit the extent and strategic importance of the springs.¹¹ Scouting for possible pastoral runs and probing for a route towards Central Australia, Stuart located and described between April and June 1859 many springs, including Elizabeth, Jersey, Herrgott, Priscilla, Hawker, Loudon, Milne and Freeling. Stuart was excited by his finds, being quick to perceive that they amounted to strategic stepping stones to the interior and, ultimately, the northern shores of Australia. They represented a line of unfailing waters through the lowest rainfall country of Australia and his final successful crossing of the continent in 1861-62 was made possible by them, a point that he stressed in the accounts of his travels.¹²

The presence of permanent water, and the fact that they had travelled through the country in good seasons, coloured the economic appraisals of the early European explorers. Within a very few years much of the mound springs country had been taken up by wealthy colonial pastoralists, including John and James Chambers, Samuel Davenport and Phillip Levi. Deceived by the initial appearance of the country, and too anxious for quick returns on their investment, they stocked at what would now be considered excessively high rates. Predictably, when the first drought hit in 1864-65 numbers crashed and fortunes were lost. The lesson was learnt that permanent water is of little account without stock feed to go with it and subsequent utilization of the country by pastoralists – which continues to the present – was much more circumspect.¹³

Although pastoralists had been the first Europeans to exploit the region, South Australia was part of a global trading nation that was increasingly seeking rapid and reliable communication links. Shipping of the time, which typically needed three to four months to cover the distance between Australian and Britain, did not provide such a link and by the mid-nineteenth century advances in telegraphy had aroused considerable interest in the possibility of an overland link to the north coast of Australia and from there via submarine and overland cable to Britain. The South Australian Government's interest in this had been one of the reasons for its support of Stuart in his final expeditions and Stuart himself was in no doubt that he had found a practicable route for an overland connection. In 1872, only a decade after he had successfully crossed the continent and after only two years of actual construction, the Overland Telegraph from Adelaide to the north coast of Australia was completed, placing the major cities of Australia in telegraphic communication with Britain and Western Europe generally, a technological development of enormous importance. Without the mound springs, telegraphic communication would not have been established as readily. With relatively minor deviations, the route of the Overland Telegraph followed the line of Stuart's travel through the mound springs and the water supply of the springs dictated the location of the Strangways and Peake repeater stations, part of the continent-wide network of stations needed to facilitate transmission of the telegraphic signal at that time.

Less than two decades on from the completion of the Overland Telegraph, the South Australian Government constructed through the mound springs country another remarkable piece of transport infrastructure, the narrow-gauge Central Australian railway to what is now Oodnadatta. Although never as directly dependent on the mound springs as the Overland Telegraph, the construction of the railway illustrated

very nicely the nexus between the springs and early European activity in the region: it was the springs which had allowed Stuart direct access to Central Australia, it was the springs which encouraged pastoralism to follow in his wake and it was the pastoral industry which the railway was primarily built to service.

Conservation and management

By 1980, when the Central Australian railway closed in favor of a new standard gauge link from Tarcoola to Alice Springs, it appeared as though the mound springs had outlived their usefulness and strategic importance to the Australian community. Improvements in technology had long overtaken the Overland Telegraph; the vehicular route to Central Australia, which had once paralleled the Overland Telegraph and narrow gauge railway, had been replaced during World War Two by the Stuart Highway well to the west and the pastoral industry - with numerous dams and artesian bores now available - had much less use for mound springs than in the early years of settlement.

Pastoralism had also impacted heavily on the springs over many years. Protective fencing constructed around key springs in the early years of pastoral settlement had been allowed to fall into disrepair as alternative watering points became established and trampling, grazing and pollution resulted. The sinking of numerous artesian bores, initially to service the railway, and later the cattle industry, also had a severe impact on springs, with aquifer drawdown contributing to significantly reduced flows and in some cases spring extinction. Flows such as those from Elizabeth Springs, which Stuart observed would be sufficient to power flour mills, had been reduced to mere trickles and Loudon Spa, one of his favoured campsites, was extinct by the mid 1970s.

In the late 1970s and early 1980s a further threat to the mound springs arose in the form of the Olympic Dam copper, gold and uranium mine near Lake Torrens in northern South Australia. Although located over 100 km to the south-west of the Great Artesian Basin, the mine planned to extract water from the Basin and pipe up to 33 million litres daily to the mine and associated town of Roxby Downs. Resultant environmental impact studies prepared for the proposed mine focused much attention on the springs and, paradoxically, the concern generated produced funding for a range of biological and heritage surveys, all of which documented and confirmed the outstanding natural and cultural heritage values of the mound springs.¹⁴

Funding for conservation and management measures flowed from the surveys, including the establishment of Witjira National Park to protect the Dalhousie Springs complex and Wabma Kadarbu Conservation Park to protect numerous springs near Lake Eyre South. An additional ten springs were fenced to exclude livestock and feral grazing animals. For non-indigenous cultural heritage, interpretive signage and building stabilisation work was carried out at the ruins of the Strangways and Peake Overland Telegraph stations and ten sites associated with the Overland Telegraph and narrow gauge railway were entered onto the State Heritage Register of South Australia and the Register of the National Estate. All indigenous sites received protection under the provisions of the *South Australian Heritage Act, 1998*.

Some concluding thoughts

The mound springs of northern South Australia have been supremely important to indigenous and non-indigenous people for many thousands of years. With their lineal alignment over hundreds of kilometres and their unfailing supply of potable water they have provided the environmental basis for a rich and multi-layered transport and communication corridor through otherwise inhospitable desert country.

The importance of the natural and cultural heritage associated with the springs has been well documented in South Australia and some important conservation and management measures have been put in place over the past two decades. Much remains to be done, however, and from a national perspective the State-specific approach is quite unsatisfactory. The Aboriginal song cycles and trading routes were on a continental scale, as was Stuart's journey, as were the construction of the Overland Telegraph, the Central Australian Railway and the Stuart Highway. What is needed is a truly national approach which involves the Northern Territory, South Australia and the Commonwealth working with the indigenous people of the region to celebrate the trade and communication routes which were based, in no small way, on these remarkable physical features of the landscape.

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Endnotes

- ¹ Harris 1981, 1992
- ² Habermehl 1980, 1982
- ³ Wilson 1995
- ⁴ Pickard 1992
- ⁵ Habermehl 2000
- ⁶ Harris 1992
- ⁷ Hercus & Sutton 1985, Badman 2000
- ⁸ McBryde 1987
- ⁹ Hercus & Sutton 1985
- ¹⁰ Babbage 1985
- ¹¹ Stuart 1865
- ¹² Harris 1981
- ¹³ Gee 1998
- ¹⁴ Harris 1992

**This paper has been published in Historic Environment 16.2, pp. 8-11.*