

JOHN McDouALL STUART EXPEDITIONS 1858-1862

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Key words: Stuart, expedition, surveying, water, horses.

SUMMARY

This is a summary of the surveying and expeditions undertaken by Stuart between 1858 and 1862 in successfully reaching the north coast of Australia and the survey skills he used to achieve that aim.

1. INTRODUCTION

April 2010 celebrates 150 years since John McDouall Stuart mathematically calculated, from his observations, what he considered to be the centre of Australia in 1860. He was half way through his expeditions to be the first person to cross the continent from the southern to the northern shore. He commanded his first expedition in 1858 and finally achieved his objective of reaching the north coast as a group of 10 men in 1862.

If a definition of a surveyor, pre digital age, is a person who can gather information based on accurate measurements of distances and angles using the current equipment available, to analyse same including a clear understanding of three dimensional mathematics and produce plans, then Stuart was certainly a surveyor in every sense of the word.

If you were able to undertake all these explorations without the loss of a man then you have exceptional leadership skills. If you are so driven to organise men and rations, ride a horse for up to 50 miles to calculate distances by dead reckoning, undertake midday observations of the sun, write your diary and at night undertake star and moon observations with complicated lunar computations then you are a driven person. But if you can do all of the above when you are beyond normal physical limits of suffering and be able to understand and observe the land where no other white person had been, you are one of a kind.

Stuart was a rare breed of man. He was, as Threadgill (1922) described a “very big little man”.

The period 1840-1862 arguably was the most fruitful era of discovery of inland Australia but also marred by tragedies. Stuart’s achievements are mentioned with those of Eyre, Leichhardt, A.C. Gregory and Sturt. Eyre, described as “the pathfinder for those land explorers who gradually

penetrated the continents and heart” (Stokes 1993) was the first to explore between South and Western Australia across the Great Australian Bight in 1893-41. Sturt undertook journeys to the mouth of the Murray and sought to find the “inland sea” between 1844 and 1846. Leichhardt explored between Queensland and the North West tip of Australia between 1844-5. Gregory started on the west coast of Western Australia, headed to the edge of the Tanami Desert and then followed closely to Leichhardt on the northern part of Australia back to Queensland. See Map 1.

Stuart, like the explorers just mentioned, was not aided by the success of other explorers. The legacy of his journeys however has been measurable over the last 150 years.

2. SCOTLAND, THEN AUSTRALIA – THE EARLY YEARS.

Stuart was born in Dysart, Scotland in 1815 and graduated from the Scottish Naval and Military Academy in Civil Engineering (some say surveying) with little details available of the course content.

He departed Scotland in September 1838 and arrived in South Australia in February 1839. Between 1839 and 1844 Stuart worked as a Government Surveyor’s assistant marking out new settled lands. In the early 1840’s Australia was in recession so Stuart was briefly unemployed trying his hand at wheat farming and hut keeping.

1844 was to be a major defining moment in Stuart’s life that formed the basis of his ability to become arguably Australia’s greatest inland explorer. He was accepted as part of Captain Charles Sturt’s planned expedition to explore the centre of Australia and find what was generally considered to exist - an inland sea. Stuart was employed as a draughtsman on the expedition. The expedition left Adelaide in a north east direction with a major stop of 6 months at Camp Glen (near current Tibooburra) due to the lack of water within the vicinity in arguably the driest part of the year. Sturt still persisted with finding the inland sea, but was met with the extremes of the gibber desert now known as Sturt’s Stony Desert and the edge of the Simpson Desert. See Map 1. It is considered that Stuart learned much from this expedition which turned him into an accomplished bushman with the confidence needed to return to the interior of Australia. He understood the need of reliable water supplies, use of horses, general organisation, understanding illness e.g. scurvy and the discipline required by all members. He also developed a lasting respect for the Aboriginals. The mystery of what lay in the centre of Australia was still not solved, but Sturt conceded there was unlikely to be an inland sea. Whilst there are not extensive records in existence, it is generally considered that between 1846 and 1854 Stuart practiced as a surveyor and was involved in real estate in Adelaide. He moved to Port Lincoln, still very much a frontier area, where he continued his involvement in surveying and drafting.

Mudie (1968) suggests that in 1854 he began to work for John and James Chambers, marking out their pastoral lease claims, and William Finke. With Finke he explored the Flinders Ranges north of Adelaide looking for gold and other minerals over a period of some three years.

3. STUARTS EXPEDITIONS

3.1 First Expedition – May to September 1858

Funded by Finke, Stuart together with only one assistant (Forster) and an aboriginal youth commenced at Oratunga north of Port Augusta (refer Map 2) and headed in a North West direction. Stuart was continually seeking a route to the centre but more importantly finding water sources, in particular Wingillpin, which was suggested as a large source by the Aborigines. He did find a permanent source which he named Chambers Creek but not Wingillpin. He always went where he believed there to be water. After finding the north west to be devoid of grass and consisting of only rocky treeless plains, he headed south west eventually reaching Streaky Bay, near Ceduna. He was always looking for the division of creeks and drainage lines but gave no real explanation of why he went that way. He eventually returned to Port Augusta and Adelaide.

On this expedition it appears he had only a compass and dead reckoning to work out the distances travelled. However, he was able to draw a map and it was this map that James Chambers studied closely and suggested Stuart applies for a 1500 square mile lease. Chambers simply moved his cattle to the area!

3.2 Second Expedition April – July 1859

This expedition is not included in the Parliamentary Papers as it was again financed by Finke and Chambers. He took with him botanist Herrgott, Muller and Campbell. Stuart started from Glens Station near Leigh Creek and undertook four loops of exploration centred north and south from Chambers Creek. Stuart consistently located springs and returned to Glen Station on 3rd July 1859. He also searched for gold with little success. Again Stuart's plans were studied by Chambers who it appears changed many of the names and features. The delay of providing maps to the Government by Chambers did little to reduce the claims lodged for leases in the area surveyed by Stuart.

3.3 Third Expedition November 1859 – January 1860

The third expedition again financed by James Chambers, introduced Stuart to William Keckwick who was to be his loyal second in command on this and three more journeys. They were accompanied by Muller and two stockmen Strong and Smith. The importance of Keckwick's loyal support and knowledge of the bush was huge and absolutely vital to the expedition's survival. So many times Stuart refers (Hankel 2001) that "I sent Keckwick in search of water." He re-surveyed around the Chambers Creek area and a considerable time around the edge of Lake Eyre without finding its end. Again, like the second expedition, he was searching for water and good grazing land. This journey mentions for the first time his use of a sextant for sun observations and the difficulties he was having with his eyes.

This is also the first expedition he mentions (Hankel 2001) calculations for latitude and variation between true and magnetic north. This will be further discussed in section 4. He is continually reading compass bearings to Mounts which in the majority still bear the same names making it simple now to follow Stuart's footsteps.

He continued to find springs that related to his second trip and camped at the Spring of Hope. Using this as a base, Stuart and his men surveyed several new leases up to the Neale's on 21st November 1859 (Hankel 2001). These extensive surveys which Keckwick claimed to cover 8000 square miles (Webster 1958) indicated exceptional surveying ability of the party using a chain and compass together with monumentation in the way of establishing stone cairns e.g. Mt Charles and connections for magnetic declination using the sextant. They chained a 10 mile base line. After the surveying, his party searched for gold. He still became intrigued by the large lakes in the area and was able to ascertain their separation. The large lake became known as Lake Eyre and the lake to the south Lake Torrens.

He returned to Chambers Creek low on supplies somewhat disappointed with not having travelled further north than his second expedition. In his typical modest attitude he perhaps didn't place enough value on the vast amount of surveying of leases he undertook. It should also be considered that each expedition must have further advanced his skills that were to later serve him well. Despite enormous suffering to himself he pushed to the limit. He continued to map valuable sources of water and grazing land and the limits of the desert. He developed his ability, on the meagre funds available, to sustain a basic diet of dried meat, flour, sugar and black tea. He also importantly developed a great respect and understanding of the Aboriginal people and perhaps their trust when he met them throughout his journeys. He didn't hesitate to sample native plants and birds to address his hunger.

3.4 Fourth Expedition March – September 1860

Stuart thought he could re supply and move off immediately for the centre. He sent Keckwick to Moolooloo, one of Chambers Stations, in the Flinders Ranges to collect more supplies, fresh horses and more men. There was a clear shortage of volunteers as Keckwick returned with one – Benjamin Head, a tall, heavy eighteen year old youth.

So, three men with ten packhorses made their way from Chambers Creek on 3rd March 1860 in pursuit of a route to the centre of Australia. They followed the springs found in the second and third expedition in a north west direction. Arguably this expedition was one of the most important, some say heroic, due to the achievements on again a private, not public funded expedition. The land marks that are so easily identifiable on modern maps and became most important future landmarks were discovered and named by Stuart. These included the Finke River, the largest inland Australian river. Also Chambers Pillar, a massive sandstone pillar in the Simpson Desert. His party was then north of the South Australian border. He found a way

through the rugged MacDonnell Ranges from the Hugh River and a most important source of water he named Annas Reservoir at the foot of Mt Freeling. He continued on and on April 22nd 1860 (Hankel 2001) proclaimed “today I find from my observations of the sun, 111°00'30" that I am now camped in the centre of Australia.” Further discussion of this momentous achievement will be discussed in section 4.

He named the nearest hill Mt Sturt which has since been re-named Central Mt Stuart. His note of 25th April 1860 (Hankel 2001) states “my reason for going west is that I do not like the appearance of the country to the north.” So he headed in a westerly direction to what he called Mt Dennison but is now known on modern maps as Mt Leichhardt, the twentieth highest mount in the Northern Territory. There is supposition that Stuart was trying to get to the Victoria River discovered by A.C. Gregory in 1858 (Map 1). This is not mentioned in Stuart’s diary but worthy of consideration as Gregory arrived in Adelaide in 1858 via Lake Torrens probably with maps or at least with advice. Stuart was unaware the Tanami Desert would be a barrier. This foray by Stuart and his men brought them close to death. What if Stuart hadn’t retreated on 4th May when he felt compelled? Who would have got to the north coast? Other explorers may have continued on and there lies the difference. With dwindling supplies, lack of water and food for the horses Stuart turned back from the eastern edge of the Tanami and struggled back to Central Mt Stuart. They rode the horses up to 50 kilometres between water holes.

From Central Mt Stuart the expedition headed north west through the Davenport Ranges naming Tennant Creek and finding a good water supply which Stuart named Keckwick Ponds known today as Bloodwood Dam. Other creeks discovered and still named such include the Bonney, Phillips, Bishops and Hayward. From the Hayward Creek they moved on to a large waterhole on a creek containing fish and occupied by other birds, ducks etc. On their way back to camp after exploring the upper reaches of the creek, they were attacked by an organised group of Aboriginals, now known as the Warumungu people. Clearly the party was trespassing on their sacred area. They retreated some 20 kilometres to the south and “arrived at Haywards Creek at eleven o’clock on 26th June 1860.” (Hankel 2001). Stuart’s navigational skill of the use of the stars and his awareness of where he was aided such navigation. He placed the name Attack Creek on his map where the confrontation took place.

Being on half rations and some 1500 kilometres from Chambers Creek (his exploration base) Stuart decided to turn back. He still believed however that “if it should rain, I shall try for the Victoria River even though I should be without rations for my return....” (Hankel 2001) The dry weather however forced them to head back to Chambers Creek via Annas Reservoir and the tracks of their north journey. Stuart (Hankel 2001) speaks of poor health of the men which he later stated as scurvy. They arrived at Chambers Creek on 3rd September 1860. The issue of providing the public and particularly the Government with copies of Stuart’s diaries and plans were again hampered by James Chambers’s insistence on retaining them. Chambers as ever, clearly wanted to use Stuart’s journals for lease applications based on feed and water. He did after all finance the expedition!

3.5 Fifth Expedition January – September 1861

Finally some Government assistance in terms of a grant of £2500 plus assistance from Chambers & Finke allowed Stuart to mount yet another expedition north. The need to find a route to the north coast was now becoming a race between Victoria and South Australia.

Charles Todd, and astronomer and meteorologist, arrived in Adelaide in 1855 to assist the South Australian Government in their investigation of establishing telegraph lines as the modern communication network. He was able to negotiate with the eastern states and in 1858 Adelaide was connected to Melbourne and Sydney and to Brisbane in 1861. Todd always had in his mind the link with England via Timor would be through the centre of Australia. The Victorian Government substantially sponsored the Burke and Wills expedition which left Melbourne in August 1860 in an attempt to be the first exploration party to reach the northern coast from the south. The South Australian Government had issued a £2000 reward for such a feat. Stuart had found the centre of Australia in April 1860. Burke & Wills reached what are generally described as mangrove swamps, not the sea in the Gulf of Carpentaria in February 1861, a month after Stuart commenced his journey. Unfortunately with dwindling supplies and communication errors they both died at Coopers Creek in June 1861.

Stuart reached Attack Creek in April 1861 with a party of eleven men including his loyal second in command Keckwick. Head unfortunately was to turn back after the start as his health had not recovered from the fourth expedition. The party included Francis Thring who would accompany him on his final journey. These two are constantly mentioned in his journal (Hankel 2001) as well as Wall and Woodforde. It was close to Newcastle Waters that Stuart and his party had to return back to Chambers Creek after finding he had travelled through dense scrub and plains he named after Sturt. He camped for some 5 weeks trying to penetrate Sturts Plains but lack of water, exhausted horses and men and low supplies forced a retreat.

On the 15th June 1861 Stuart remarks (Hankel 2001) “I am again forced to turn – it is quite hopeless to attempt any further. It would be sacrificing our horses and perhaps our own lives, without the least prospect of attaining our end”. Stuart arrived back in September 1861 the same month his journal was tabled in Parliament. He learnt of Burke and Wills disappearance, which was confirmed in November 1861.

3.6 Sixth and Final Expedition January – December 1862

Despite his ongoing poor health, Stuart was determined more than ever to reach the north coast. Equally determined were the South Australian Government, Todd and James Chambers. The former two to achieve their aim of establishing a telegraph line to link Australia to England via Adelaide and the latter to seek yet more grazing leases.

On 8th January 1862 Stuart left Chambers Creek with nine men who would share with him the exaltation of finding the northern shores of Australia but return loyalty to Stuart well beyond normally required to ensure his return after he physically collapsed. The party consisted of his nine men being loyal lieutenants Keckwick and Thring, W.P. Auld assistant, Stephen King, John Billiatt, James Frew Jnr., Heath Nash, John M^cGorrerey and F.G. Waterhouse naturalist to the expedition. All except Stuart, Keckwick and Waterhouse were under 24 years of age, keen and had some experience of life in the bush and the hardships associated with same. Unfortunately before they departed Stuart severely injured his right hand in handling a horse.

The Government allocated £2000 for the expedition with Chambers and Finke to supply some 70 horses. It took some three months to reach the camp established in the fifth expedition at Newcastle Waters. It took another three months to find a way through Sturts Plains, through ponds, across rivers and streams especially the Roper, the Arnhem Land Plateau, boggy marshes and swamps to finally reach the coast on 24th July 1862. Just south of this point Stuart cut his initials in a tree. On 25th July 1862 Stuart tried to ride to establish the mouth of the Adelaide River but was stopped by mangrove mud. That day they raised the Union Jack on the beach and buried a tin with a note of such achievement near the tree.

The journey to the north took its toll on the horses, health (especially Stuart) and rations as articulated in Hankel 2001. Worse was to come on the journey south. Stuart was concerned, from past experience, of waterholes drying up and rations were severely reduced. It took some 5 months to reach Chambers Creek. His diary notes for the journey (Hankel 2001) continually refer to the search for water, rations, dealing with aboriginals and leaving behind what Stuart considered excessive baggage and his concern for his men. Stuart's health continued to deteriorate after spending so much time on a limited diet. The illness was scurvy and that coupled with his injured hand and reduced sight made it increasingly impossible to ride a horse. "I now begin to feel the want of my health dreadfully..." Hankel (2001. p. 375). From the end of October at Mt Harris we "carried him 400 miles in an ambulance" (Auld 1984). The ambulance was in fact a stretcher slung between two horses built by M^cGorrerey. It is reported in both Webster (1958 p. 245) and Bailey (2006. P. 277) that Stuart learnt of the death of his major sponsor James Chambers at Mt Margaret in November 1862. They reached Chambers Creek with Stuart still on the stretcher on 5th December 1862, a week before the remains of Burke and Wills were found.

Stuart arrived back in Adelaide in mid December 1862. On 21st January 1863 ten skeletal men dressed in ragged clothes on emancipated horses rode in a procession through the streets of Adelaide. Ironically that date coincided with the funeral of Burke and Wills in Melbourne. Stuart received his £2000 reward in 1865. There were queries in some quarters whether Stuart ever reached the north coast. After some failed searches the marked tree was discovered in 1883.

4. STUART: AS A SURVEYOR

4.1. Introduction

The summary of each expedition is brief and doesn't, in depth, detail what Stuart undertook in his three and a half years in the outback. That is best left to reading the books referred at the end of this paper. There is still conjecture between authors of the authenticity and accuracy of sources of information on Stuart.

To appreciate what he undertook you have to travel in his footsteps including climbing some of the mountains he named. You learn to appreciate his ability to produce detailed maps by simply using his bearing and estimated distances from his journals. Mudie (1968 p. 178) attributes the following to Benjamin Head. "You could not beat him. You could not beat the little fellow, no matter who it might be. He had the instincts of a bushman. However foolish he may have been in town, there is not a man in Australia can say a word against him as a leader in the bush. He knew his way about if any man did. He was a born leader of men; the sharpest little fellow you would find in a year's march. There were no flies about Stuart, take my word for that, and Pat's (Pat Auld) and, indeed any man who went out with him, he was a born explorer ... Stuart was a splendid bushman, and could tell within a foot almost where we were. I never came across the likes of him. He was not always straight in town, but steady enough in the bush."

His early work on leases and said plans is well documented in Webster (1958). His work around the settled areas would assumedly be using a transit theodolite and chain. Some existing triangulation would have been in place as the settled areas expanded. On the first and second expeditions most likely he only had a compass, stopwatch, a telescope and used dead reckoning. He was always aware of where he was and the topography of where he was travelling. Dead reckoning was the ability of Stuart to work out, through different country, what a horse could travel in an hour, hence the importance of his stopwatch.

His third journey mentions the sextant, the compass and a chain whilst the journals of his fourth, fifth and sixth journals include reference to maps, sextant, compass, almanac, telescope, stars, moon and planets. It could be assumed he had a diary (called journal by some) and a field book with loose sheets on which he drew his features and traversing. The latter are difficult to find with perhaps a suggested explanation in section 5.

4.2. The Centre and Lunar Time

Much has been written about Stuart declaring he found the centre of Australia in his fourth expedition. Mathew Flinders, arguably the greatest sea explorer of the Australian coast, explored same between 1798 and 1803 producing a map. Whilst there appears no mention of copies of Flinders' plans being in Stuart's possession (Hankel 2001), Webster (1958 p. 166) suggests they were. They would certainly be in Adelaide prior to any departure. Whilst Brisbane was not settled

until 1842, the longitude of the eastern coast and western coast, shown as Sharks Bay on Flinders map can be calculated. The mean equates to 133°30' E. Drawing a line at longitude 133°30' E on Flinders map between the north and south coast gives latitude of 22° S, Stuarts adopted centre of Australia. Somerville (1954) argued that Stuart's pride was more based on reaching the central latitude than the reliance on longitude and that having camped in different places in the area considered "the centre to be any place in the vicinity".

In the library of the Royal Geographical Society of South Australia are two original diaries 29th November 1860 - 3rd July 1861 and 4th July - 5th September 1861. These are diaries of his journeys with intermittent references to latitude and longitude. They are not field books. However, written in the back of the latter diary are observations (sets) dated August 1861. These refer to the use of a stopwatch and observations constantly to the limbs of the sun and moon. There are also observations recorded to Saturn and the stars Spica and Vega, the latter being the bright northern star visible in the southern hemisphere in August.

Stuart would be able to use his almanac to calculate latitude based on his sextant recordings. By his journals he undertook these latitude observations frequently. The matter of longitude has been discussed verbally with Assoc Prof. Frank Leahy, Principal Fellow of Department of Geomatics University of Melbourne. He has been recently undertaking considerable research into Wills' surveying and astronomical observations. It is agreed that both Stuart and Wills didn't have a chronometer and relied on complicated lunar calculations to adjust their stop watches to obtain longitude. Longitude could have been worked out in association with dead reckoning but would be totally inaccurate after time. The notes in the diary suggest that Stuart was undertaking accurate longitude calculations. The following is attributed to Assoc Prof. Leahy: "A lunar distance is the angle between the moon and a star, planet or sun. The stars chosen are 'more or less along the path of the moon' as it passes through the stars every 28 days. The nautical Almanac contains listings against every 3 hours of Greenwich Mean Time of the lunar distances to about 14 stars (but of course there is only about 7 of these can be seen at any particular time). Spica, by the way, is one of them. The time is calculated by interpolation of the listings in the almanac. For Spica, an error of 10" in the angle reading produces an error of about 18 seconds in computing the time which in turn produces an error of about 8km in the longitude. Most sextants are graduated to 20" so errors in longitude of 20km are likely."

5. THE LEGACY OF STUARTS EXPEDITIONS

The discovery of a route through to the north coast allowed Todd to plan the telegraph line and its link to the outside world after other alternatives including overland to Queensland were discussed. This is clearly the everlasting legacy of Stuart's surveyed route. In 1866 a line was completed to Port Augusta and by agreement in 1870 the line was to be extended through to Darwin. Little deviation from Stuart's mapped route was undertaken except moving to the east in the MacDonnell Ranges to Alice Springs and around Mary River. References have been made to

the ease with which surveyors for the telegraph line were able to use Stuart's maps with such accuracy and confidence. Todd's immense respect for Stuart was evident when he joined the line at Central Mt Stuart in 1872.

The telegraph not only opened communication between Adelaide and the world but all places between Adelaide and Darwin. It was a defacto road in many cases used by early settlers to get to larger towns e.g. Alice Springs. Post telegraph line was the Ghan Railway linking Adelaide to Alice Springs, replaced recently with a new line from Adelaide to Darwin and becoming a major freight and tourist transport system. Then there is the major road link aptly named the Stuart Highway, a major arterial road for transport of goods and livestock to the respective markets. All close to Stuart's original route. These measurable vital communication links all owe their origins to Stuart's original survey.

Applications for leases, especially from Chambers, were the basis of action immediately upon release of Stuarts plans after each expedition. It must have been frustrating to Stuart however, despite his relationship with James Chambers, to see his work altered prior to release and the arguments between Chambers and the Government. This conflict was somewhat reduced by the Government funding the last two expeditions. Stuart would have surrendered his field book to Chambers and others to prepare plans that we can still use today. No doubt Stuart would have felt some loss when they were out of his control. These field books do not appear to be still in existence.

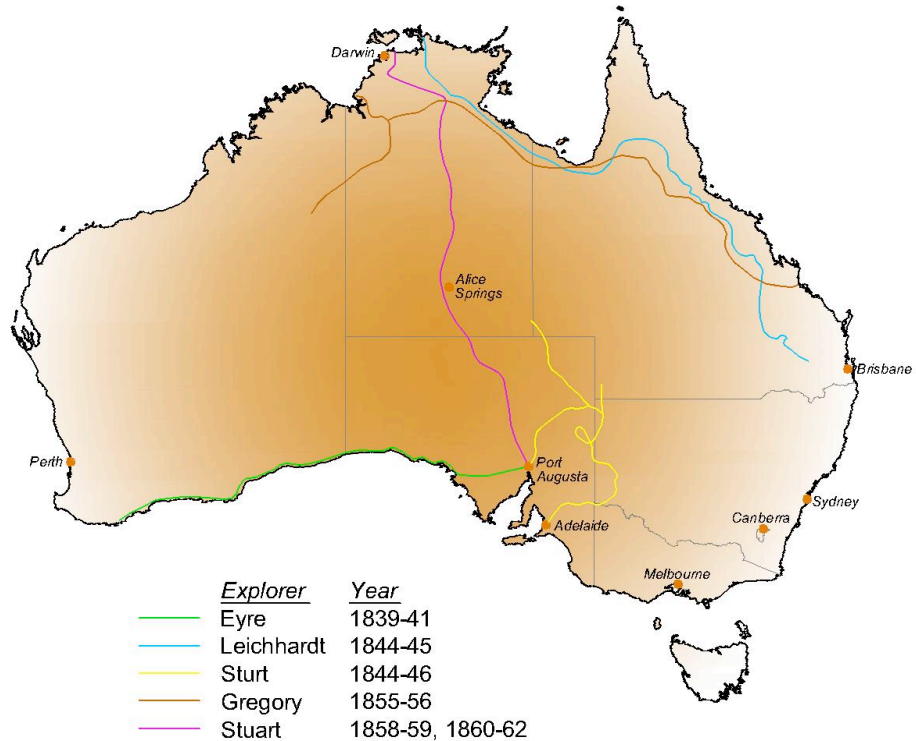
6. CONCLUSION

Stuart and A.C. Gregory were arguably Australia's greatest inland explorers. The latter was certainly financed and equipped much better than Stuart who had to rely on Chambers and Finke's support rather than the State Government. It may very well have been possible for Stuart to reach the north coast earlier if he had the Government support that Gregory, Babbage and Tolmer were granted. That said, he didn't and was totally driven to reach the north coast despite illness and afflictions that arguably he had since arriving in South Australia and were to see him die at such an early age in England in 1866. The key attributes that made Stuart one, if not the best inland explorer, include:

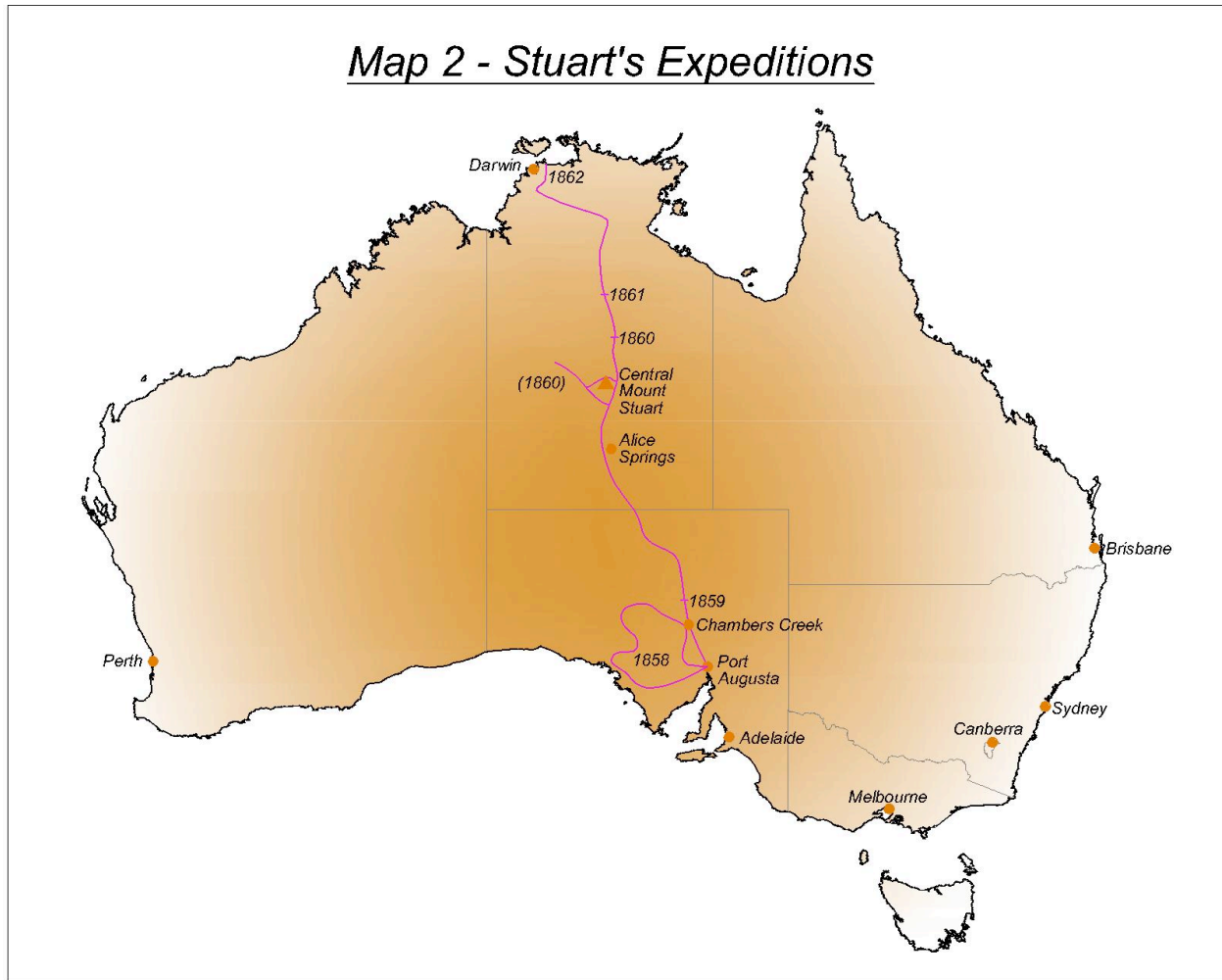
- He had exceptional dead reckoning and navigational skills that enabled him to understand exactly where he was.
- He spent more time in the field and explored more land than any other explorer without the loss of a man.
- He learnt from every trip how far to push the physical limits and when to turn back.
- He understood and cared for his horses and knew their limits and ability to move quickly through land and how far each type could survive without water.
- He was courageous, a great leader and his concern and respect for his fellow expedition members was reciprocated.

- He mapped and detailed what was considered important for future settling of areas – winds, creeks, water supplies, general slope of land.
- He had a concern and understanding of the Aboriginal people well beyond other explorers and white settlers. This appears to be supported by Strehlow (1967).
- He was a great learner and teacher. Members of his parties were trusted with assisting in observations and mapping, especially when his health suffered. King and Auld continued in surveying.
- He was able to endure the most extreme physical hardships.
- He never lost focus of his objectives and commitment to his tasks which included meticulous recording through his journal and field books. As a surveyor this is an obvious commendable achievement for generations to come.
- He undertook these journeys at an age considered beyond the expiry date for explorers.

Map 1 - Australian Exploration



Map 2 - Stuart's Expeditions



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BIOGRAPHICAL NOTES

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