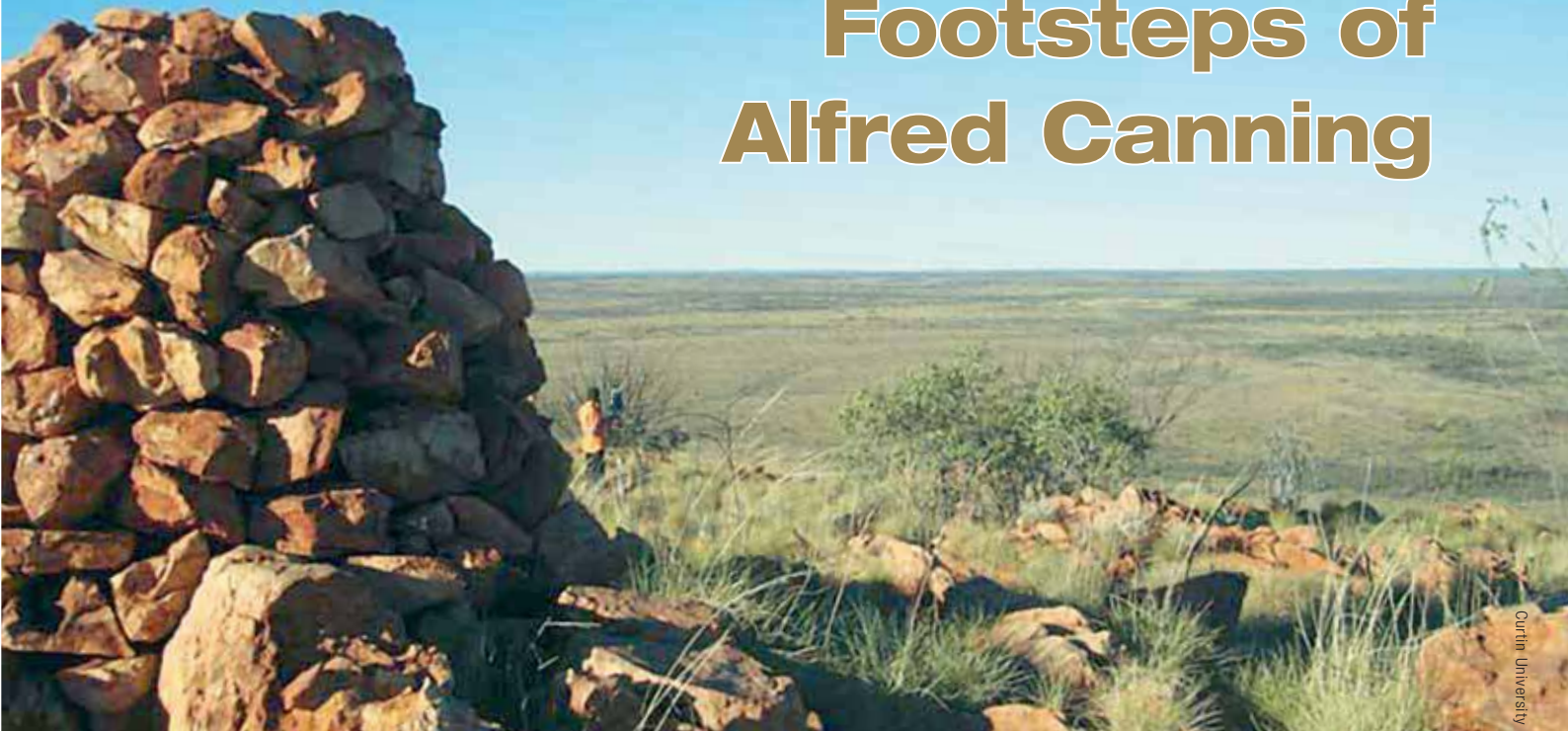


Following in the Footsteps of Alfred Canning



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A hundred and one years later, a group of Curtin University students re-survey the Canning Stock Route using GPS equipment.

TONY SNOW

In early 1906, Alfred Canning and Hubert Trotman sat in their Perth office discussing the equipment requirements for their coming expedition, a survey for a cattle stock route from the Kimberley down to a railhead at Wiluna. Their talk revolved around the amount of food, the number of camels, the number of people and, of course, the type of surveying equipment, they would need.

A hundred and one years later, a group of final-year surveying students sitting around the boardroom table in the Spatial Science Department at Curtin University discuss the same problem. Their discussion revolves around the amount of food, the number of vehicles, the amount of diesel and, of course, the type of surveying equipment required.

Although the two surveys covered the same ground (our expedition was a little shorter), the changes in technology meant they were a world apart in terms of surveying methods and time required. Canning used a prismatic

compass, a theodolite, a survey chain and chronometers. The Curtin students planned to use GPS equipment.

Canning started his expedition in earnest from Wiluna on 29 May 1906, heading in a northerly direction into the deep interior of Western Australia. The party consisted of Canning and seven others. He had 3150 kg of food and equipment, carried on 22 camels. They required an average of 2000 litres of water per week.

Canning's initial route went through country previously explored by John Forrest in 1873 and covered by CH May's triangulation survey of 1893. From there, it moved north through the Frere Ranges and Lake Nabberu to Winditch Springs.

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From Canning's field notes it is very difficult to determine how he actually surveyed the route. A typical page from a book showing his traverse running north consists of bearings and running chainages between route corners. The fact that he does not show any angles or evidence of sun observations would seem to indicate that he was using

Reciprocal trig heighting from an eccentric station placed on Mt Davis

the prismatic compass alluded to by Trotman in his summary of survey gear.

The first page of his field notes indicate that he checked his prismatic compass bearing against the plan bearing of the Wiluna main street. It is thought that distances shown in these field notes were paced, as his notes only ever show 100 link distances.

However, his notes on his journey from Halls Creek back to Wiluna show more detail. He includes multiple



The Canning Stock Route is marked in yellow.



The trig station cairn above PA61, McGonky Hill



Joe Mahoney surveying reference marks for Canning's Original Post No. 1, found at Goodwin Soak

angles, odd chainages and evidence of sun observations for azimuth. It is possible that he was also determining latitude from ex-meridian observations of the sun, since a number of traverse corners show a latitude.

Only one point in his traverse shows both a latitude and a longitude. It was taken at Canning Post No. 1. This was the start of his traverse into unexplored territory, at Goodwin Soak (Well 11) on 26 June.

It is assumed that at this point his chronometers, which would have been set in Wiluna two months previously, were still working correctly. This would have allowed him to determine an accurate longitude for this all-important point. Certainly the trek north was one of survival and exploration rather than accurate surveying.

Canning finally arrived back in Perth on 17 July 1907 to a hero's welcome led by the Premier John Forrest, an exploration surveyor of some note himself.

On 3 July 2008, we set out to survey the southern section of Canning's path, from Georgia Bore south to Wiluna, a distance of over 600 km.

On leaving Newman, the party consisted of six vehicles carrying 2000 litres of diesel, 300 litres of water and 600 kg of food. This was in addition to surveying equipment and personal gear for 16 people. It proved a very tight squeeze.

Our surveying equipment consisted of four Sokkia GSR2700ISX GPS receivers, two Sokkia SR2650 dual-frequency receivers linked to the Omnistar-HP d-GPS augmentation service, one Set 530S3R total station and one Sokkia Set1X total station.

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The plan was to carry out a GPS baseline survey from a first-order state survey mark near Georgia Bore to another mark at Wiluna, a total distance of 604 km.

The purpose of the survey expedition was to attempt to find and accurately locate a number of original Canning marks that were thought to be close to the present 4WD track.

In addition, as part of Landgate's geodetic upgrade in the region, the expedition aimed to locate and position as many FX benchmarks along the southern section of the track as possible.

These marks had been placed and levelled in 1968 by surveyors Dave Chadleigh and Russel Wenzholz, as part of the Australian Height Datum Network surveyed in the 1960s. While having an accurate RL, these benchmarks have never been surveyed for horizontal position. Their approximate positions have been mapped using mileages and position in relation to the edge of the track. However, a large number of the points located by the expedition were found to be a kilometre or more from their mapped position.

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The cairn had probably been untouched for almost 50 years and was in perfect condition...

The survey started from Georgia Bore on 6 July. The group was organised into a number of survey parties.

One party, in vehicle number 5, was designated to remain at the first GPS station until the lead party, in vehicle number 1, had located the first benchmark for the day, and recorded the required overlapping baseline observation. GPS baseline observation time was calculated using Landgate's geodetic specifications of 50 minutes plus 2 minutes per kilometre.

Vehicles 2 and 3 were tasked with accurately locating the position of all the remaining wells and trying to locate any original marks left by Canning adjacent to the track. These two parties also looked for the more difficult benchmarks missed by the reconnaissance party and positioned these points using the Omnistar system.

The final task for these two teams was to pick up the GPS receivers after the required overlapping baseline data had been acquired.

The vehicle left at the morning's camp would wait its allotted GPS baseline time and then move to the day's next



The remains of a reference tree blazed by AW Canning, Diebel Springs

camp, generally 70-80 km down the track. It was imperative to get this unit forward of the last benchmark set up by the reconnaissance vehicle, and to set up as close to the coming night's camp, as early as possible.

The first Canning mark of any significance found was a blazed tree, and the possible butt of an original post at a location called Diebel Springs. The springs had been found earlier in the month by a Landgate surveyor, Ken Leighton. Using Canning's field notes and magnetic bearing observations to surrounding hills, it was possible to identify the location of the springs and a blazed tree he had left adjacent to them. This tree has subsequently died, but the remains of the trunk, with the original blaze, can still be seen.

From Canning's field notes it is very difficult to determine how he actually surveyed the route...

Using the bearing and distance connection shown in Canning's field notes, it was then possible to backtrack to the approximate location of his traverse post. With some careful digging, the possible remains of an original post were found and positioned.

The lower section of the stock route was re-traversed back in 1932 by two surveyors, Payne and Alsop. This survey commenced just north of Wiluna and finished just north of Well 9, on McGonky Hill. The original post on this hill, PA61, had been replaced by an army survey team in 1959 with a copper pipe set in concrete and converted to a trig point.

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Canning's Original Post No. 2 and the successful survey crew

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An extract from Alfred Canning's field book 1B, Sunday Well, 11 July 1906



The Curtin expeditioners: (left to right) Peter McConkey, Geoff Robb, Tony Snow, Sue Snow, Joe Mahoney, Gerhard Hoskins, John Walker, Wojciech Koleszko, Andrew Hare, Sam Keenan, Wayne Garwood, Eva Di Blasio, Eugene Brown, Huan Nguyen, Kirby Gamble, Robbie Wongawol and Gerry Nolan. Joe Mahoney was the project leader.

On top of the mark they had then erected a rock cairn that was 1.2 metres in diameter and 1.8 metres in height, with a trig vane set on top.

The cairn had probably been untouched for almost 50 years, and was in perfect condition. It had been decided to connect this point into the GPS traverse, but as there were no reference marks it was necessary to disassemble the cairn to survey directly to the copper pipe. It took the students over an hour to pull the cairn apart and once the survey had been completed, it took them another hour to rebuild it.

On our last day on the track, 17 July, we also found a blazed tree adjacent to Well 3 that Payne and Alsop had referenced during their 1932 survey. This blaze was a reference to a post placed by John Forrest in his traverse through the area in 1873.

The GPS baseline traverse survey was finally closed off on to a state survey mark on Mt Alice, 10 km northwest of Wiluna. In addition, a survey team was also able to locate and connect the GPS traverse to the cadastral corner post from which Payne and Alsop's survey commenced in 1932.

In summary, the expedition was an overwhelming success, both for the students and in terms of the geodetic upgrade work. In the course of the two-week survey, the team travelled over 600 km through an area of Western Australia where very little geodetic control previously existed.

In the process, the team accurately located over 40 of the original marks. Fourteen of these were converted into SSMs, with 8 of these stations also being Auspos points. Over 30 original posts placed by Payne and Alsop were also located and accurately positioned. And of course a number of original Canning survey marks were also found. ❖

Tony Snow is a lecturer at Curtin University. He led the expedition to re-survey the Canning Stock Route.

The Aboriginal Experience

Aboriginal people have no reason to celebrate Canning's expedition, but plenty of reason to remember it. At the beginning of the twentieth century, Kimberley cattlemen were looking for a way to traverse the western deserts of Australia with their cattle. Between 1906 and 1910, Canning surveyed the route and sank a total of 52 wells.

On his return to Perth he had to face the publication of charges by Blake, the expedition cook, that Aborigines had been ill-treated. A Royal Commission exonerated him in January 1908, although he had admitted chaining up Aboriginal men at night.

According to an entry in online encyclopedia *Wikipedia*, Canning's party constructed the wells with the forced help of the Martu people, whose land the route traversed.

Canning himself found it difficult to locate desert water sources. In order to gain Martu assistance in locating water along the route, Canning captured several Martu men, chained them by the neck, forced them to eat salt and then waited until they got thirsty enough to lead his party to a well.

Thankfully, times are different now. Slim Williams of the Martu people, and Robbie Wongawol of the Western Desert people, accompanied the re-enactment expedition.

'It was a great privilege for all of us to have two traditional landowners to show us across their land and regale us with stories of their people and traditions around the nightly camp fire,' says expedition supervisor Tony Snow.