

The Telegraph - a wire around the world

It's now fifteen years since the internet began to transform the way we communicate. But the beginning of the age of modern communication was over 150 years ago when the telegraph began to spread around the world. For Australia, so isolated by distance, this wonderful new technology had a huge impact, connecting the far reaches of the globe. Paul Davies retraces one of the great engineering achievements of the 19th century.

Robyn Williams: This is *The Science Show* on ABC Radio National, I'm Robyn Williams. You may have noticed that it's the 15th Year of the internet, which has transformed how we communicate. But the beginning of the age of modern communication was over 150 years ago when a wire was starting to spread around the world. It was the telegraph and it had a huge impact on Australia. Suddenly farmers knew what price to expect for their grain before shipping it across the globe and mining companies knew the worth of their precious metals. Paul Davies retraces one of the great engineering achievements of the 19th century.

Paul Davies: The town of Alice Springs in the Northern Territory conjures up images of the Flying Doctor, outback tours and Aboriginal art. But this remote settlement derives its existence from the old stone building beside me, the original telegraph station. In 1872, just a few years after the first European crossing of Australia, this far flung outpost of the British Empire became linked all the way to London by a continuous wire stretching right around the world, traversing deserts and jungles and snaking beneath vast stretches of ocean.

It was the scientific and technical marvel of its age and it transformed Australian society, business and politics as profoundly in its own way as the internet revolution of today. In this program I'll be discovering some of the amazing stories of privation, daring and innovation behind the construction of the world's first international telecommunication system. And to do so I'm linking up, quite literally, with the other end of the line, Porthcurno in Cornwall, the communications hut near Lands End where the original submarine cables came ashore. You'll be relieved to know that we're not going to use Morse Code over the old telegraph line but a digital satellite link that's about 64,000 times faster.

Joining me at the other end, and in decidedly different weather conditions, is the Director of the Porthcurno Telegraph Museum, Mary Godwin. Mary, how did a sleepy little Cornish village get to be a global telecommunications hub?

Mary Godwin: A chap called John Pender decided it would be a good idea to link up the British Empire and he founded a company called the Falmouth Gibraltar and Malta Telegraph Company to lay the first link in a route from the UK, originally to India and then onto the Far East. He soon realised that Falmouth wasn't necessarily the best place to land the cable, so he kept the company name but changed the landing location to, as you say, a very sleepy, no horse town called Porthcurno. It was a beautiful sandy beach and it was a perfect bed on which to lay the precious cable. By about 1900 there were 14 cables coming out from Porthcurno, which made it the world's biggest telegraph station.

Paul Davies: Mary, your opposite number here in Alice Springs at the Telegraph Museum is Bruce McCrea and he'd like to have a few words with you.

Bruce McCrea: Hi Mary, a very good evening from Central Australia, and I guess it's early morning for you over in Cornwall. We're sitting here under the veranda - how are things in the other end of this marvellous telegraph link?

Mary Godwin: Well, things are great. It's something that's completely new to most people and when people come they're usually quite gobsmacked about the actual fact that it was a physical line linking Cornwall with Australia under the sea.

Paul Davies: Wiring up the world represented the culmination of a long history of electrical signalling. As Tom Standage, Technology Editor of *The Economist* and author of *The Victorian Internet* discovered, the subject had an unusual origin.

Tom Standage: The origins of telegraphy I like to think go back to an experiment that was done in 1746 with a bunch of monks. And what they did was, they all stood in a row about half a mile long and they all had bits of wire linking them together. And then the Abbá Nollet connected a primitive kind of battery called a leiden jar to one end of the chain of monks and this gave all of them a powerful electric shock, at which point they all would have said, 'Ow'. Now this all sounds very silly but is, in fact, extremely important because firstly, they all said, 'Ow' right the way along the line, which showed that you were sending a signal right the way along that line. And secondly, they all said, 'Ow' at the same time, and that meant you were sending the signal very, very quickly over a long distance. So if you could figure out how to move on from electrocuted monks onto a, sort of, more repeatable system then you might have the basis of a communications device which would enable you to send long messages, very quickly, over long distances.

Paul Davies: A determined young man, also in France, took up the challenge. Thwarted in his ambitions to become a clergyman by the French Revolution he turned instead to engineering. He wanted to build an electrical signalling device but like many others before him found it all too difficult. So in 1791 he came up with a clever alternative.

Tom Standage: Today, when we think of telegraphs we think of electric telegraphs, we think of wires and Morse code and dots and dashes and telegrams and that sort of thing. But, in fact, the word was originally coined by a Frenchman, Claude Chappe to describe his invention, which was mechanical and it involved a system of towers, and you would have moveable arms on the top of the towers and you could see the next tower in each direction with a telescope, so you could actually put them quite a few miles apart. And this system allowed you to send messages very quickly and, in fact, the French government built a national network of these things and this was called the telegraph, which means the 'far writer'. And that's the origin of the word.

Paul Davies: But when Napoleon's army began moving around Europe there was urgent need for a new communications system, preferably one that used wires so as to be less conspicuous and reach places that were not limited to line of sight. All sorts of weird and wonderful contraptions were proposed. Also, various schemes for encoding the information were tried. The most successful code was the simplest, and it still bears the name of its American inventor, Samuel Morse.

Tom Standage: The nice thing about Morse's approach was that you only needed one wire, whereas the rival system in Britain put forward by Cooke and Wheatstone involved five or six wires and that was much more expensive, I mean, it was five or six times more expensive because you were running all these extra wires. So the really neat thing about the Morse system is that you only needed a very simple wire, so the complexity was taken out of the actual technology and put into the hands of the operator. You needed to learn the Morse code and you needed to be able to both send it and receive it. And initially people thought that was going to be too difficult, but it turns out to be one of these things like learning to play a musical instrument, some people turn out to be very, very good at it and so those people then were able to send and receive messages very, very quickly using dots and dashes.

Paul Davies: Once the commercial potential was appreciated the overland telegraph caught on rapidly. Imperial nations such as Britain began exploring ways to stretch the wires across or rather beneath the seas to link together their distant colonies. A crucial technical breakthrough came with the discovery of gutta percha, a latex-like substance from Malaya that had the right insulating properties. Mary Godwin in Porthcurno.

Mary Godwin: Probably one of the major problems was the nature of the bottom of the ocean. Really, you had to know the profile of the bottom of the ocean because you had to lay a cable that fitted snugly along the ocean bed and there are things like undersea volcanoes and also things living in the sea. Sharks have been known to decide to bite them, there were worms called Teredo worms, which used to like to eat the gutta percha, which was used to insulate the copper wire at the core of the cable. It was the Victorian equivalent of going to the moon 100 or so years later and it attracted the great minds and great amounts of money and the challenges in the same way.

Paul Davies: Were there early fiascos?

Mary Godwin: The first transchannel cable 1850 from Dover to Calais was very, very experimental, it was really just a copper wire with some gutta percha insulation and it didn't have enough substance to lie at the bottom of the ocean.

Paul Davies: The cable floated.

Mary Godwin: The cable floated. There's also the apocryphal story that a piece of it was cut off by a French fisherman and taken home as an unusual, bizarre form of seaweed and of course, that meant it didn't work. And even with the early Atlantic cables in the 1850s, again it was highly experimental. At that time, for example, there wasn't a ship big enough to take the whole thing and so they tried by starting with two ships at either end sailing and meeting in the middle and then tried again by meeting in the middle and sailing away from each other. But, as you can imagine, in mid-ocean, especially if the weather's not too good, it's a very challenging thing to do.

Tom Standage: The story of the first trans-Atlantic cable is epic in its own right. It was built by a chap called Cyrus Field, and the reason no one had really tried to do it before was that, the more you knew about telegraphy the less likely you were to try something this daft. And he had the advantage that he knew nothing about telegraphy whatsoever, he just thought it would be a great idea.

Paul Davies: Amazingly, he got investors to back his scheme and the cable actually worked - after a fashion. Celebrations were held in London and New York and Queen Victoria saw fit to send a telegram over the new cable to President Buchanan on the 16th August, 1857.

Reading:

The Queen desires to congratulate the President upon the successful completion of this great international work in which the Queen has taken the deepest interest.

Paul Davies: The earliest trans-Atlantic telegraphy although quicker than steamship was hardly a snappy conversation. Attempts to speed up the data rate by increasing the voltage turned out to be disastrous, as any physics student would now predict.

Tom Standage: Unfortunately, the cable itself stopped working almost immediately because the chief engineer of the project really didn't know any electrical theory and he thought the best way to send messages over long distances was to use huge voltages and this destroyed the cable. So they then had to raise more money, and the American Civil War intervened as well. So the only reason that the second and third trans-Atlantic cables could be laid by a single ship was that the biggest ship in the world had been built and no one really knew what to do with it, and that was the *Great Eastern*. You could fit an entire ocean's worth of cable onto it and it would then chunder across the sea and lay it.

Paul Davies: Frustratingly, the cable snapped after 1300 miles and the vessel couldn't raise the end to fix the break. The following year the contractors started all over again and laid another cable without a hitch. Immediately afterwards they returned to the broken end of the first cable and managed to retrieve and join it, thus providing a pair of working cables. This time the cables lasted. John Nash, who himself worked as a telegraph engineer at Porthcurno, demonstrated how his 19th century predecessors sent messages.

John Nash: This is what's called the cable key and was the principle method of sending messages on cables at the time you're talking about. With an ordinary Morse key you have a single key with dashes longer than dots, but in cable Morse or cable code dots and dashes are equal length but opposite polarity. It was found to give better discrimination over long cables. So it's got two keys - that's dot, that's dash.

Paul Davies: Before long there were cables fanning out across the world. Alan Renton, Curator of Porthcurno Telegraph Museum, points out where they came ashore.

Alan Renton: This is the beach here at Porthcurno, it's a roughish day, usually the water is a fabulous turquoise colour on that white sand but today a bit choppy, very, very windy last night, big waves breaking. But behind us here is the cable hut. Here we go into the cable hut.

In here is the termination of all the cabling, see where the cables are coming inside the building here, you've got about 14 cables. So as we look at the cable here we're looking at a braided steel cable of about an inch, inch and a half in diameter. The actual steel braid is peeled back to expose the copper core, which is the only part

we're really interested in, which then goes into these terminal boxes. We've got Vigo and Bilbao here, and Carcavelos, which is Lisbon. There's two lines in from here - there's the cable from the Isles of Scilly, we've got St Johns, Newfoundland, France and Gibraltar and a couple of others from Bilbao and Brest. And at one stage there were 14 cables coming in.

Paul Davies: Let's follow the route of one of the earliest cables as it left that beachside hut and threaded its way towards the most distant outposts of the British Empire. This is how an Australian newspaper, the *Victorian Argus* described the route.

Reading:

Thus the long line we've been following across the wreck strewn bottom of the Bay of Biscay; in the blue depths of the Mediterranean; down in the heated waters of the Red Sea; across the broad stretch of the Arabian Sea; through central India, again plunging into the sea in the Bay of Bengal; treading the channels of the Straits of Malacca; crossing through the rich tropical scenery and amidst the towering volcanoes of Java, and then, once more diving down into the coral depths of the ocean, finally makes its landing on the low mangrove covered shores of North Australia.

Paul Davies: But the story of that final link in the chain began some years earlier in Cambridge and a blossoming romance between a British astronomer and a plucky young lady. Alice Thompson, who works appropriately enough for *The Telegraph* newspaper in London, is their direct descendant.

Alice Thompson: My great, great grandfather was someone called Charles Todd who came from Greenwich and whose father was a publican and who didn't really have much money but went to work in the Royal Observatory, and he was very good with figures. Anyhow, he managed to wangle his way out to Australia. He had met Alice when he was very young but she was even younger, she was only 12 and she was hiding behind the sofa when he came to see her parents, and he said to her parent, 'I'm going out to Australia, but I don't know what to do if I haven't got a wife'. And she's meant to have jumped up from behind the sofa and said, 'I will come with you Mr Todd', and some years later she did.

Paul Davies: Alice was still only 18 when she and her new husband arrived in Adelaide 150 years ago. It seemed to Charles incredibly cut off.

Alice Thompson: When he got to South Australia I think he just realised how far away it was from Britain and so all your news was six months late. If a King died or a Queen died or anything really happened in Europe, you didn't know about it until six months later. And I think in the end that drove him to try and get Australia linked to the rest of the world.

Paul Davies: It needed the telegraph but that was not going to be easy to achieve, particularly for someone based in Adelaide, separated from Darwin, the cables likely point of landfall, by two and a half thousand miles of harsh, uncharted wilderness. Laurie Wallace, President of the SA Morsecodian Society describes Todd's vision.

Laurie Wallace: He would like to have seen the cables that were progressively coming down across Asia to be brought into Australia and he thought, why not at Port Darwin, why not at Palmerston, as it was then called, and then bring the line down through to Adelaide, and then we could radiate out to Sydney and Melbourne and Brisbane with the messages. So Adelaide would be the key nerve centre for communications with the world. He wanted this to happen but so did New South Wales, so did Queensland. Speaking to the government he said, 'What if I can build the line from Adelaide to Darwin. We can do it in two years'. This was early in 1870. They put a proposal to the British Australia Telegraph Company that South Australia would build a telegraph line from Adelaide, Port Augusta to Port Darwin to connect with the undersea cable. They would complete the work in two years and they would do it at their cost. They accepted it; a bill was passed in parliament in Adelaide in June 1870 and work started on the line later that year. Charles Todd was ready to go.

Alice Thompson: I think what was extraordinary about the idea to build a telegraph system across Australia was the fact that Australia hadn't really been crossed then. It had only been crossed once or twice, so no one really knew what the interior was like; they didn't know still if there was big lake there, they didn't know how hilly it was. They assumed there'd be quite a lot of trees, I think, so that they could make telegraph poles as they went along. They didn't realise that they'd have to import everything into the interior and it was just an extraordinarily bold concept, and they also said they'd do it in a very short period of time. And, you know, if they didn't do it, then they'd have to start paying penalty clause back and it was a very, very dangerous things to do and I don't think they quite realised how dangerous it was until they'd started out.

Robyn Williams: You're listening to *The Science Show* on ABC Radio National with Paul Davies on the history of the telegraph.

Paul Davies: By anyone's standards, the logistics of such an undertaking were daunting. Canberra based historian, Ann Moyal.

Ann Moyal: It was rather like enrolling for war. In the first instance they advertised in the newspaper in Adelaide, they drew 400 men from all over the country of every kind and condition, all because of the romance of the idea. They had to carry everything with them, they had to take an enormous, massive number of bullocks and horses and the whole human story is so enthralling and I don't think most people have any sense of it.

Laurie Wallace: They had to take rations. They used to take a mob of sheep, they would take some cattle, so that they had some food but of course progressively as they went further and further north a lot of their provisions ran out. Of course they certainly had flour and the like to give them a staple diet, but some of the men did get scurvy. It was horrendous, I mean, we're going back to 1870, for goodness sake.

Reading: Diary of S W Herbert, Roper River, 1871.

For provisions we have tinned meat, preserved potatoes dried in rough particles like tapioca, fried vegetables in pressed cakes and flour and biscuits. The cooks make hash me grande stew by putting dried potatoes into a half bucket of water, adding 8 pounds of tinned meat and stirring well.

Ann Moyal: Todd divided the undertaking into three sections: the southern section about 600 miles north of Adelaide and a northern section, and they had to send 80 men and many horses and many bullocks and all the equipment up by ship to Darwin so that it could begin at the Roper River. But then they had this highly challenging central section and only one portion of that had been explored. And again, the reason that South Australia was able to take on this project, which was very competitive with bids from Queensland trying to get the overland telegraph connection, they could do it because in 1860 to 1862, John McDowell Stuart the great explorer had managed to get to the centre and then he turned left to go to the Mary River in Western Australia. So he showed that you could make a track through Australia. But there was a large section in the central where nobody had been so this was a tremendously challenging section. So to link these three sections, to have all your men, materials and all the poles they brought in from Germany, the iron poles to use where there was no timber and galvanised wire to put up, in itself was an undertaking that could never be done today.

Paul Davies: That wasn't all plain sailing, was it?

Ann Moyal: Far from it.

Paul Davies: What were some of the difficulties they ran into?

Ann Moyal: Well, of course, it covered territory which ranged from some of the hottest temperatures that you could find anywhere on Earth. Freezing nights, right through up to...they had torrential monsoons at one stage in the northern sector and when they came to put poles in the ground, there were these great basins of water and rivulets running in every direction.

Of course they went prepared to cut down trees wherever trees existed, but there are many areas across that vast stretch from Port Augusta to Darwin where there are no trees, hence the iron poles. And of course for each section a number of overseers were appointed and they had their sub-overseers and it fell to them to take responsibility for making sure that the day's work was done in the day, because the whole underlying principle of this enterprise was that it had to be done in 18 months, and it started in June 1870, and if they didn't actually carry through the whole thing would have collapsed and there was terrible anxiety.

So just to give you an idea of how the men worked: the overseers were responsible for maintaining discipline and the health of their men and they had to report every day on how many poles each labourer had put in and how much wire had been constructed across. And they got their men up at 5.30, had breakfast and worked of course till about 11, and then across the heat of the day they had a rest till 2, then they worked till nightfall. They had to put in 20 poles to every mile and in an area like the centre of Australia, which is the highest lightning area in Australia, every second pole was fitted with a lightning rod.

Paul Davies: Even today the journey across the continent isn't easy, as Alice Thompson found when tracing her ancestors for her book, *The Singing Line*, the name the Aboriginals gave to the telegraph.

Alice Thompson: I know that going across 140 years later with my husband I found it incredibly difficult, and we had a van, we had a satellite system to track where we were going. It should have been very easy - it was 40 degrees but it should have been very easy in comparison, and we still found it quite tricky, so I don't know how they did it when a lot of them were walking across. They had appallingly bad equipment, they didn't know where they were going; they found that the horses couldn't survive in the heat, they had to use camels. It was an incredibly arduous difficult journey. And when I was doing my crossing I found it very exciting when you'd be in the middle of a desert and you'd suddenly see one remaining pole that had actually stayed against all the elements and there were all the insulators, the little porcelain bits on the top of telegraph poles and occasionally, once or twice, you could find one and that was deeply exciting. And also the receiver stations are still where a lot of the small towns and villages are all the way up.

There'd be telegraph parties when I was there. They had no idea who I was and they'd say: Why don't you come to this barn dance or this party and it would be for the telegraph, and that was really fun actually. And they'd have prizes and they'd take the porcelain insulators and they'd dress them up as dolls and you would win one as a raffle prize, and that was great actually.

Paul Davies: Although the construction of the telegraph was undeniably a triumph of enterprise and technology, it was not a cause for celebration amongst Aboriginal Australians whose land it crossed.

Alice Thompson: There were Aboriginal camps and bases along the way and in many ways it must have been appalling to them because in many ways it did open up the interior. And there were a lot of edicts for the men not to take any Aboriginal artefacts, not to get too involved and if they met any of them to behave extremely well. I think they did realise that they wanted to get on with them rather than to try and clash with them.

Paul Davies: Bruce McCrea in Alice Springs.

Bruce McCrea: The Aboriginal people in the early days destroyed quite a bit of the line. They worked out if they could climb the pole they could bend and snap the wire, drop a span of wire and they had wire as a tool. If they broke an insulator they had a sharp-edged cutting tool and they caused quite a bit of damage to the line.

Paul Davies: So they weren't sabotaging it for what we might say political reasons, they were doing it because they thought well, this looks useful.

Bruce McCrea: Look, they had a need for the materials and the way that the telegraph companies overcame that here, when they went out to do a section repair they'd take with them some off-cuts of wire and broken insulator material and leave them on the ground under the wire. So the local people were only taking what they needed; it was on the ground, no need to climb the poles and the journals record an almost 80% reduction in line faults over a three months period. It was smart lateral thinking.

Betty Pearce: My name's Betty Pearce and my dad was the son of a white man named Tom Williams, who was a linesman for the telegraph line.

Paul Davies: And did he work in this part of the country?

Betty Pearce: Yes, there are some photographs in one of these buildings here and my dad often went with his father - when kids were ten years old in those days they sort of worked, so he used to do the general working with the men as well.

Paul Davies: He didn't shimmy up the telegraph poles?

Betty Pearce: No, I don't think he was allowed to, but he did work with the men and do all the running around that what you would call a junior worker would do.

Paul Davies: Was life harsh even in those days?

Betty Pearce: Yes it was harsh but I don't think that people identified as harsh at the time because dad, he didn't talk really all that much but he often said that it was good, because his white father kept him and his white father had him there, whereas quite often the Commonwealth Government, as in the Native Affairs, would take the part-Aboriginal child away from the black mother and that didn't happen to my dad.

Paul Davies: And in those days, how big a town was Alice Springs?

Betty Pearce: Well, Alice Springs was no town at all, it was just a flood plain and my Aboriginal family's ceremonial and fighting ground.

Paul Davies: How did the arrival of the telegraph affect the way of life of the traditional owners?

Betty Pearce: It affected the way of life of traditional owners in that progress followed, as in the land being developed into cattle stations. My grandmother was an Untulya woman and her family's country was taken over by a cattle station developer and he called in Undoolya. It was the same with my adoptive grandfather's country on the north of Alice Springs, Bond Springs station was settled right over the top of our family's country so that those people had to help develop the station.

Paul Davies: Now you were saying earlier that Alice Springs is a misnomer, there really are no springs here is that right?

Betty Pearce: That's right, there's no spring there. It has a rock base where it keeps the water there for a while.

Paul Davies: Nevertheless, this is obviously a very important geographical location because of the water, it would have been really important to the people who lived here a couple of hundred years ago. How did they respond to effectively being displaced from such an important location?

Betty Pearce: Well, we still tell stories about my great grandfather's brother. He saw these people drinking water down near the Heavitree Gap and they felt sorry for them because that's salty water down there and they brought them up here to drink the good water and our mob lost everything. If my great grandfather's brother hadn't felt sorry for the white people who were drinking this horrible salty water, just sort of

stepped back and said, hey, let them go and find the fresh water somewhere else, maybe all this would have been developed somewhere else.

Alice Thompson: They were beginning to really panic and they didn't know what they were going to do and that's when they came across the springs and when they came across the springs and they realised there was water, they realised that they would be able to then go from end of the country to the other and they'd found the link through the MacDonnell range. They then sent back a message saying they'd found the springs and they called it Alice after Charles Todd because it was the head of operations and it was obviously a polite thing to do I think, to name it after his wife - although I was very sad, because she never actually went up to Alice Springs. He spent a lot of his time there and was always going up and down the line and was obsessed by it till the end of his life, but she never, ever wanted to go, I don't think.

Reading:

Letter from Alice Todd to Charles Todd.

I hope we shall never be separated again. It is so hard. My anxiety about you has sometimes been unbearable. When the first letter arrived telling me you had fever, I thought I should lose my reason. I don't know how I did get through the first few months of your absence. Do not disappoint me now. I'm afraid if you're not home by the time you mentioned I shall be ill with excitement.

Robyn Williams: You're with *The Science Show* on ABC Radio National where Paul Davies is following the wire that transformed the world.

Paul Davies: In all, 11 telegraph stations were built along the Australian line and operators would take down the messages and repeat them to boost them on their way.

Ann Moyal: Beginning at a place called Beltana and going forth, these names have rather slipped away now, Strangway Springs and The Peak, and Charlotte Waters. Then there was of course at Alice Springs, Barrow Creek, and Tennant Creek and Powell Creek, and Daily Waters, the Catherine, Yam Creek, and when you consider that the men put into these places were dealing with conditions they never had to deal with before and the loneliness of their situation.

They were marvellous men the telegraphists, they were terribly well dressed, they were dapper, they were well educated, they were tremendously enterprising, occasionally one or two of them had to do operations on someone nearby that something terrible had happened to, and have the communication with a doctor back in whatever capital city. And they were the most resourceful men.

Paul Davies: At the station that bears Alice's name a couple of dozen men and their families soon established a permanent settlement. Bruce McCrea showed me around.

Bruce McCrae: Look, here we are. That was the original telegraph office right there, from 1872 to 1878.

Paul Davies: Says girl's bedroom on it now.

Bruce McCrae: Yeah, that was when it was a children's home after it had closed in 1932.

Paul Davies: Can we identify from the building what the layout was like in 1872?

Bruce McCrae: Well we can, we can imagine that this particular building or this particular room was divided into four. So look Paul, where we're standing right now is the site of the original telegraph office when it opened here in 1872.

Paul Davies: Is there any remnant of the line outside, can we see it?

Bruce McCrae: You can see this line out here, and this is the remnants of a line here. A single strand of eight gauge galvanised iron wire, fencing wire and that's the remnants of the line. That was a northbound circuit and the wires you see over there with that wooden pole was the southbound circuit. When they first built the line it was a mixture of wood and steel poles. Termites very rapidly began to destroy the wooden poles, so over a period of about ten years they had to replace all the poles with the steel poles.

Paul Davies: I have to say, looking at them they don't look very high.

Bruce McCrae: They weren't, in those days of course there was no need to provide clearance for trucks and heavy machinery obviously. And there was also another method in that because the height of the line through the desert was really such that you could service it from the back of a camel, so it was a smart bit of thinking for 1872-74.

Paul Davies: Now when this place opened for business in 1872, what sort of complement of staff would there have been, how many people lived here?

Bruce McCrae: Generally the station establishment was around about 20 to 25; that included the telegraphists, the station master, his family, linesmen, cooks, the blacksmith, gardeners. So 20 to 25 would have been the normal establishment for the station when it was operational.

Paul Davies: And just living here in this cluster of buildings we see. There was no town of Alice Springs then?

Bruce McCrae: No, no, this is the first settlement. So there were other buildings here but what you see is the actual original station buildings.

Paul Davies: Recently Laurie Wallace managed to get hold of some of the original telegraph wire.

Laurie Wallace: A few years ago a man came in from a property around Tennant Creek and he said, 'Look, I took this wire off the old overland telegraph line that passed through my property and I had it hanging up in the shed. Would you like it?' Of course we would like it because it was part of the No.8 gauge galvanised iron wire that was used in the original overland telegraph line. And you note that if we look at it

that it's still, although rusty on the outside, bright and shiny internally. In fact, I'd like to connect that into the circuit so that you can hear the Morse code signals passing over part of the original overland telegraph line. Now I've got that there, I'm going to take the wire to connect into the line.

Paul Davies: Wonderful stuff.

Laurie Wallace: So what message would you like me to send through this historic piece of No.8 gauge galvanised iron wire and we'll hear it on the sounder.

Paul Davies: I know the very message. It's the very first message that Mr. Morse himself sent from Washington to Baltimore, and that was 'What hath God wrought'.

Getting the wire up from Adelaide through the parched terrains to Alice Springs was certainly a fine achievement but the hardest part of the project lay in the north between Alice Springs and Darwin. Another team was slogging their way up the Roper River - these men were facing very different conditions with widespread flooding and thick mud delaying progress.

Laurie Wallace: The country can be very beautiful when the rainfall is there, it's a fascinating country there, but as you go further north you then move into the sub-tropical and the tropical areas and of course you get the wet season with floods and waters coming down the rivers and flooding the area. And that's where the northern party ran into problems. It was let to contractors Dalwood and Derwent and they were to complete 500 miles. When they'd completed about half of that they were sacked because they got caught up in the wet and they couldn't move forward with their work. And the government parties then moved in and a new leader was appointed there, a man by the name of R C Patterson who had previously been an engineer with the railways in South Australia and he went to the northern section and took charge and he pushed it through.

Reading: Journal of Robert C Patterson, assistant engineer.
Monday, 25th December, 1871. Christmas Day.

It rained very heavily the whole of last night. I left the traps here this morning and went 8 miles on horseback to see what the country was like. Found all the creeks bank high and the whole face of the country under water. The ground is so boggy that it would be useless attempting to get my buggy, even if I had bullocks. I therefore determined to leave half my party here with the wagons and push on with pack horses. Mr Milner accompanied me to where his bullock drays were camped. He has two very fine teams of bullocks and his drays, which at starting had three and a half tons each, have now only 12 hundredweight and yet he has been a fortnight doing three miles, and I believe if the rain continues he will be a month doing the next three. Got back to camp last night at 6pm, one creek I crossed during the day was running some inches over the saddle flaps.

Alice Thompson: When I went up the Roper River you could see the playing cards that they'd made out of tin that they'd collected, when the men were stuck and there'd been flooding and they'd be literally stuck on top of mounds just waiting for the water to get down and that's when they'd made these tin cards, and they'd wait for weeks and weeks and weeks just for the water to subside. And it was really that end of the

operations that was often harder than the southern end of operations because it was so damp and they were very arduous conditions and they didn't really know about the tropics. These were men who'd all come from the south and they didn't have a great understanding of the sort of tropical storm or of wet, damp conditions. Just about everything went wrong on the Roper River actually. One of them was eaten by a crocodile, one of the boats sank, they were always getting stuck on sandbanks. They hadn't ever really operated in anything like this before and for many I think at the beginning it was a huge adventure. It was only as they suddenly realised what they were up against that they began to think, you know, what are we doing. And these weren't adventurers, like they weren't people who'd come across to find gold, they were very straightforward working men who all had some sort of craft that they were good at.

Reading: From the letterbook of Charles Todd.

My great anxiety now is to dispatch the teams from the Roper with rations and material for the construction parties and to establish an express service to carry messages over the gap between the two ends of the wire. Mr Patterson hoped to get some teams away this week but heavy rains during the last few days, about ten inches in a fortnight will, I fear, prevent a start being made till next week.

Paul Davies: By this stage the undersea cable from Java had reached Darwin and the northern tip of Australia was at last connected to the rest of the world.

Laurie Wallace: Even before the line was completed they had a section of it, around about 100 miles, where the north was OK for telegraph signalling to Darwin and the southern section was OK for signalling through to Adelaide. So they ran a pony express. They'd send the telegrams from Adelaide to the point where the southern line finished and then the pony express would take them to the next point and then they would be flashed through to Darwin. And of course the undersea cable was operative at that stage before the overland telegraph was completed and they could then send a message on.

Reading: Advertisement in Adelaide newspapers 24th June, 1872.

Messages will be received at any South Australian telegraph office for transmission to London and other places in connection with the British Australian Telegraph Company's cables during the ordinary office hours of Tuesday next. These messages will be forwarded from Tennant Creek by horse express over the portion of the line at present incomplete and are expected to reach their destination in 8 or 10 days.

Paul Davies: But the many delays in the overland cable meant looming financial penalties that threatened to bankrupt the small population of South Australia.

Ann Moyal: Fortunately someone was on their side. As they were busily trying to make the connections between the southern, the central and the northern line the cable broke down for quite some weeks and then no word was said any more about the penalties for each day that the overland telegraph line lagged behind. And in the event it took them two years exactly rather than the eighteen months that had been first set down.

Paul Davies: On the 22nd August 1872, six months late and four times over the original budget, the ends of the great overland line were finally joined in the remote outback 800 miles north of Alice Springs.

Alice Thompson: At the final few poles Patterson decided he wanted to be the man who had linked it together. But because it was already linked he decided to cut the line so he could re-link it together at the place where he was. So he cut the line so it could be formerly linked up. When he cut it it then wouldn't go back together again. So what he did is he put a bit of it around one arm and then linked the other part of it around the other arm and didn't realise that the current that would be going through would then electrocute him. Now although he was fine he got such a serious fright from it that I think he probably thought that the experiment hadn't been worth it.

Meanwhile Todd was at Central Mount Stewart right in the heart of Australia, and he decided that he wanted to be on his own in the middle of nowhere to receive the first message. And he took this special pocket relay that he had out and he put it onto the line so that he could take the first message and then he spent the rest of the night basically tapping away, sending messages all out, all around across Australia and it was an incredibly exciting moment. I think he was fantastically excited and also being underneath the stars on a night like that must have been extraordinary.

Reading: Telegram from the Chief Secretary for South Australia to Charles Todd - Thursday 22nd August, 1872.

We opened the line at 1 pm this day as it was completed. We compliment your men for the praiseworthy efforts and untiring diligence that they've displayed in bringing to a successful conclusion this great work under your able superintendents. Accept my congratulations that your troubles are now over.

Reading: Telegram from Charles Todd to Chief Secretary.

Many thanks for your kind congratulations on the completion of the telegraph which, as an important link in the electric chain of communication connecting the Australian colony with the mother country and the whole of the civilised and commercial world will, I trust, redound to the credit of South Australia.

Reading: The Register, Friday August 23rd 1872.

At 1 O'clock on August 22nd the government received a message direct from Port Darwin intimating that the last length of wire had been stretched and that uninterrupted communication across the continent had been established. The message was instantaneous in its transmission. Immediately on receipt of the news the red ensign was hoisted on the Victoria Tower, the town hall bells were rung, the press flagstaffs were decked with bunting and the consular flags were hoisted. The public offices were also ordered to be closed and the clerks were granted a holiday for the afternoon.

Paul Davies: This is the very building in Adelaide where the overland telegraph came to an end and it was finished in 1872. The building is still very well preserved, it's marvellously ornate, it's still used as a post office and with me is Laurie Wallace the President of the South Australia Morsecodian Society. Now, Laurie, to our right

there's a door that says Corporate Real Estate. Do I understand this correctly that behind there over 100 years ago that was Sir Charles Todd's very office where the telegraph messages would have been sent from?

Laurie Wallace: That's correct, Paul. As we walk through that door you can visualise that this is the very spot where the first telegrams were received on the overland telegraph line.

Paul Davies: We still see Sir Charles Todd surveying the scene from the portrait here at the end of the main section of the post office.

Laurie Wallace: We certainly do, and when Sir Charles Todd, he was only then Mr. Todd, returned by train into Adelaide from Central Mount Stewart where he was when the overland telegraph line was completed, then they feted Todd and his men with a dinner at the Town Hall. Beforehand, Todd and his men assembled in this very area here and they marched out to the street and they were given a standing ovation by the hundreds of people that lined the route down to an exhibition ground behind our Government House.

Paul Davies: By this time the undersea cable was repaired and Australia was truly part of the world's telegraph network.

Reading: The Adelaide Observer, Sat. November 16th 1872.

South Australia's demonstration in honour of the establishment of telegraphic communication with Great Britain and in complement to the men upon whom has devolved the task of carrying out her share of the enterprise, was an unequivocal success. It was fitting that the completion of as great work like the Anglo Australian Telegraph forming, as it does, a landmark in our national progress and intimately bound up as it necessarily is with the future of this continent, should be made a subject of general rejoicings.

Ann Moyal: It was regarded by everyone as, at the time, the most wonderful event that had occurred in Australia. And when one goes back and looks at it today, one realises that that was certainly true.

Tom Standage: I like to draw this analogy between the telegraph of the 19th century and the internet today, you can't get any quicker than instant and the point at which instant communication over long distances first happened was actually in the 19th century.

Paul Davies: Meanwhile, back at Alice Springs the sun is beginning to set behind the old telegraph station and the birds are coming home to roost. Bruce McCrea and Mary Godwin are reminiscing over our 21st century digital satellite link to Cornwall.

Bruce McCrae: I often think as I close up of a night time, what the people who were here in the 1900s, how they'd react to this marvellous piece of equipment that's sitting around here on the veranda now.

Mary Godwin: Well, I think they couldn't possible imagine it but it's worth trying to imagine how fantastic it would have been when that cable was finally completed and

instead of taking 45 days for a message to get through from the UK to Australia it took less than 24 hours. It's great to speak to you and we'll have to have a staff outing to Alice Springs some day.

Bruce McCrae: Mary if you were to come here I'm sure I could find several bottles of really good Australian red and we could sit down and compare notes, we really could.

Mary Godwin: It's a deal.

Robyn Williams: And I'll toast to that. Paul Davies presented the Wire Around the World. It was produced in Australia by Pauline Newman.

Guests

Mary Godwin - Director Porthcurno Telegraph Museum Cornwall
<http://www.porthcurno.org.uk/html/9917864.html>

Tom Standage - Technology Editor *The Economist* Author *The Victorian Internet* Published by Weidenfeld & Nicolson 1998
ISBN 0 297 84148 3 - <http://tomstandage.com/>

Alan Renton - Curator Porthcurno Telegraph Museum Cornwall
<http://www.porthcurno.org.uk/html/9917864.html>

Bruce McCrea - Director Aviation and Signal Telegraph Museum Alice Springs NT Australia

Dr Ann Moyal - Historian & Author *Clear Across Australia: A history of telecommunications* Publisher:Thomal Nelson Australia
1984 ISBN 0 17 006266 X

Laurie Wallace - President South Australian Morscodian Society

Alice Thompson - Author *The Singing Line* Chatto & Windus 1999 ISBN 0701166762

Betty Pearce - Resident of Alice Springs with family connections to the telegraph station.

Readings: Ian Goodwin, Peter Lavelle, Scott Levi