

# Bringing music to their ears

**Gabrielle Chariton** speaks with Professor Graeme Clarke, inventor of the bionic ear.

Imagine growing up with a severely deaf father.

Professor Graeme Clark did and it inspired a vision destined to change the lives of thousands. He brought the joy of hearing to more than 30,000 deaf children and adults in 120 countries across the world by inventing a bionic ear.

"I remember feeling embarrassed when I helped my father at his pharmacy as a young boy," recalled Graeme. "People would have to ask him for their medications so loudly that everyone in the shop knew what ailment they were suffering from! I dreamed that one day I would find a way for deaf people, like my father, to hear."

As a boy, Graeme had a strong desire to discover new things. "I read about the lives of Louis Pasteur and Marie Curie and realised that research was a fascinating thing to do," he said.

Thus began a brilliant career, which commenced at the University of Sydney in 1966. Graeme's early studies were focused on discovering how the brain would respond to electrical stimulation for coding sound. He continued this research when appointed as the Foundation Professor of Otolaryngology (ear, nose and throat surgery) at the University of Melbourne. Aged just 34, Graeme was the youngest clinical professor in the country.

He then decided to return to his quest for a cure for deafness. "In 1967 I returned to the relative poverty of life as a research student to follow my vision for a bionic ear," he said.

Graeme and his team of scientists conducted their research for the bionic ear under a barrage of intense criticism from fellow scientists, which resulted in a lack of funding. Graeme raised small sums of money himself, but the big breakthrough came when Sir Reginald Ansett held a telethon to raise funds. Success finally arrived when the world's first multiple-electrode bionic ear was implanted in the ear of a Melbourne man in 1978, enabling him to hear and understand running speech.

The bionic ear was a reality and changed the lives of adults, children and eventually, babies across the world. It was the first major advance in helping the deaf to communicate since sign language was first developed 200 years ago.

Graeme considers deafness to be a 'silent' handicap. "People with normal hearing just can't imagine what it's like to be deaf. You can close your eyes and imagine you're blind; you can see a physical handicap. No one understands what it's like to be living in a silent world," he said.

This deep sympathy for the deaf and a true desire to help people continued to motivate Graeme. He's still pushing the frontiers in bringing hearing to deaf ears.

"Audio communication embodies the very fundamentals of human interaction. The ability to share, learn and laugh binds us together in community.

"I'm now leading research teams focused on bringing the bionic ear into the next decade. We are developing a product that will allow high-fidelity sound recognition, so patients will be able to hear and appreciate music. We are also improving the speech recognition systems, to make it easier for patients to hear speech in a noisy environment," said Graeme. "We're using nanotechnology – working with parts smaller than dust-mites – to make the bionic ear totally implantable."

And it doesn't stop there. Graeme is currently studying how to use nerve growth proteins to make the hearing nerve and the inner ear regenerate, so that one day hearing loss may be prevented. He's also leading a collaborative project with Telstra to determine how simulations of brain processing mechanisms may improve speech recognition technology. "Speech recognition is a big issue for communications and technology – it could revolutionise the way we operate machines," mused Graeme, who has already revolutionised so many people's lives.

Recently awarded Senior Australian of the Year 2001, Graeme is proud that the development of bionic ear has been recognised as an Australian innovation, because, despite all the obstacles, he "really wanted the bionic ear to be developed in Australia."



Professor Graeme Clark, inventor of the bionic ear.

"I am very excited that research and medical developments are recognised in this way," said of the award, which is just one of many bestowed on him during the course of his career. "Our nation is filled with so many opportunities it's so important to recognise and aspire to your dream – anything is possible!"

And the man who inspired the dream was Graeme's father – now aged 96, (who didn't even have the bionic ear implanted), is full of praise for his son. "I'm thrilled to bits to have lived long enough to see my son's childhood dream to help deaf people come true," he said. "Through sheer determination, his work has led to people with implants being able to hear the sounds of voices, wind in the trees and even the traffic."



Professor Clark, Senior Australian of the Year 2001, (pictured with former Minister for Aged Care Bronwyn Bishop) continues to push the frontiers in bringing hearing to deaf ears.