Death of Fred Symons

Fred Symons, Professor of Telecommunications and Information Engineering in the Department from 1989 to 1996, has died from stroke at the age of 70. Telstra has provided substantial funding and support for the Department over the years, especially during the period of Fred's appointment. The following is an address presented by Peter Gerrand (MEngSc 1970) at Fred's funeral.

Fred Symons – Highlights of His Career

by Peter Gerrand

Fred's remarkable 40-year career began when he won an engineering cadetship from the PMG, the Postmaster General's Dept, to study electrical engineering at Adelaide University, from 1956 to 1959.

As a first year undergraduate, he met Mary Hosking, a physiotherapy student, in 1956 through the Student Christian Movement; he married her in the middle of his final year 1959; Mary had already graduated.

Marriage was obviously very good for Fred, as he graduated with1st class honours. He worked for just one year, 1960, with the PMG in South Australia, and in January 1961 he sailed to England with Mary to gain a year's industry experience with GEC at Coventry.

Then he won a further scholarship to spend 2 years at Imperial College London – during this time Michael was born. At the Imperial College Fred studied advanced telecommunications technology towards a Graduate Diploma. (Fred would have been very amused to know that this week he received by post a posthumous invitation to the Imperial College's centenary celebrations! That would have appealed to his sense of humour.)

In early 1964 he returned to the PMG, not to Adelaide but to Melbourne, to work in the PMG Research Labs, as the 'Divisional Engineer, Probability'. A wonderfully broad title, but it reflected his expertise in mathematics and statistics.

In 1966 Fred was recruited to work in Harry Wragge's new Switching & Signalling Subsection as Divisional Engineer, Software on Harry's IST Project. This was an extremely ambitious project, aimed at designing one of the world's first computer-controlled telephone exchanges, using digital technology. There were no textbooks available to help the designers.

Fred was in charge of designing and implementing the software, and the Hungarian-born engineer Andy Domjan, who became Fred's closest friend outside his family, was in charge of designing and building the hardware. Andy and Fred used to catch the same train home on the Box Hill – Lilydale line, and the time they spent chatting together helped their problem solving and added to the depth of their friendship.

The software languages available at that time were extremely primitive – barely above machine code in their intelligibility. But Fred and Mel Ward, who worked for him on this project, together with other members of Fred's team, produced an impressive intellectual edifice of functional design specifications to ensure that this computer-controlled switch would interwork properly with the surrounding telephone network. This was ground-breaking R&D – the IST project was in competition with similar projects at Bell Labs in the US and the top telecommunications labs in Japan, Italy, France, Canada, Germany and the UK. And the Australian team was the first in the world to produce a computer-controlled digital switch that successfully handled live telephone traffic.

If this had been any of those other six countries I mentioned, the new exchange would have been used as the prototype for a commercial product that would have been rolled out throughout the country of origin, and then marketed to the rest of the world. But this was Australia, so instead it became just a valuable training ground for many of the next generation of telecoms engineering managers, some of whom rose to very senior positions in Australia and overseas. And it enabled those who stayed in the laboratories, now called TRL, to apply their

first-hand expertise to evaluate the technology products that emanated from overseas, from those competing overseas laboratories…

In 1971 I first met Fred, joining his Section as a lowly Engineer Class 1. He almost immediately loaned me to Greg Crew, who was running another section with more pressing deadlines. I chose to interpret this as generosity on Fred's part rather than rejection! In early 1972 Fred was promoted to head a new section called Network Studies, a title that Fred interpreted very liberally, and I rejoined him as a junior engineer. Fred had some innovative management ideas, designed to challenge and bring out the best in people, such as setting up task forces headed by the most junior member to which he, as the most senior member, would willingly contribute. He continued to encourage and act as a mentor for many junior and several not-so-junior staff, in all of his years at the Labs.

In 1974 Fred won an even better scholarship, with support from Harry: a Commonwealth Public Service overseas scholarship, enabling Fred to work towards a PhD at the University of Essex from 1975-77, with a generous financial arrangement that enabled him to take with him Mary and their five children, Michael, David, Kate, Peter and John. They rented an old farmhouse – centuries old – in the countryside, about 30 minutes drive from the University. Valerie and I visited and briefly stayed with them in the summer of 1976; despite being the hottest summer in England for 200 years, it was a lovely setting.

Fred's formal supervisor at Essex was an entrepreneurial academic called Mike Hills, so entrepreneurial he was rarely ever there! Mike made a habit of recruiting talented mature-age postgraduate students from overseas telecommunication companies to enrich his group's expertise; in fact Fred's predecessor as Mike's overseas postgraduate student had been Sadahiko Kano from NTT Labs Japan, who went on to become Chief Planner for NTT, the world's largest telecommunications company in those days.

Mike recognized that Fred knew far more about telecommunications than he did, so he leant on Fred to do a bit of lecturing for him, setting up a new course. Fred cheerfully agreed, but it added significantly to his work load, and Mary has memories of him telephoning from the University often to say he would have to work late – usually until after midnight.

Fred was never short of innovative ideas, and what he decided to do for his PhD was to invent a new technique to find and correct the errors in network signalling protocols. These protocols operate invisibly in the network every time you use a mobile phone, or take cash out of an ATM, or browse on the Internet – so it's important they work properly. Fred came up with a new diagrammatic technique that he called Numerical Petri Nets, and as well as developing the theory, he implemented a software prototype that he brought back to the Telecom Research Labs, TRL, when he and Mary and the kids returned to Melbourne in 1978.

It wasn't until a year or so after that, when he became head of Switching & Signalling Branch at TRL in 1979, that he felt that in good conscience he could assemble a small team to take his ideas further. This team, led by Jonathan Billington and helped by the local software house Unico, developed PROTEAN, a powerful protocol debugger based on Fred's Numerical Petri Nets. We used PROTEAN to find and correct errors in the engineering specification being developed in Geneva for a new signalling system, No. 7 signalling, which was to become the most powerful signalling system in the world's telecommunications networks for the next 20 years. Fred's research was always idealistic and ambitious, but it was also always oriented to achieving practical results with considerable social benefits.

From 1979 to 1985 he was Head of Switching & Signalling Branch – a team of about 100 research engineers, scientists, technical officers and administrative staff. He was a good captain-coach to the team, despite being very busy in interfacing with the Branch's clients and with senior management. He also tried hard to find opportunities for Australian industry to collaborate in many of our projects.

In the following four years, 1985 to 1989, Fred was Assistant Director, Strategy at the laboratories, and was also an external member of OTC's R&D Board, and represented Telecom in Canberra on committees of the Dept of Industry R&D Board when John Button was the Minister. Unfortunately for Fred's attempts to persuade the Federal Government to be more supportive of local R&D and local commercialisation in

telecommunications, the main game in Canberra at the time was the politics over what should happen to Telecom – should it be chopped into several pieces, or made to compete with OTC, or forced into a shotgun marriage with OTC prior to opening up further competition? The shotgun marriage eventuated in 1991. But by then Fred was back in the university sector.

In1989 Fred became foundation Professor of Telecommunications at Monash University, a position he held until he retired in 1996.
Bruce Tonkin, who worked very closely with Fred at Monash, has emailed me the following words:

> "Fred was known both for his innovative approach to all areas of his work, as well as his underlying sense of fun in everything he did. In fact some students thought he was Woody Allen. He was well liked by both staff and students for his positive can-do attitude, and also his willingness to assist all students regardless of their academic abilities."

Fred was dogged by bad health in his years at Monash, but despite that Mary can remember him regularly working at the University preparing lectures to well after midnight, getting home often at 2 or 3 in the morning, after a day full of lectures and meetings – just as he tended to do during his three years at Essex.

Many of us here today benefited from Fred's friendship, his generosity with his time, and the encouragement he extended to us during his very energetic career. Fred was a wonderful human being, and I'm very grateful to have had him as a friend.

23 March 2007