CENTREFOLD

Charles Semple

Conventional wisdom has it that mathematics is a young person's game. Given this, it is surprising the number of successful mathematicians who ventured out into the world at large for some time before settling down to mathematical research. Charles Semple is a case in point.

A proud native of Napier—where apparently the weather is always perfect—Charles studied mathematics at Massey University in Palmerston North. After successfully completing an honours degree there, he was invited by Graeme Wake to stay on to study for an MSc. However his friends were all leaving and he instead headed off to do a Diploma of Education at the Auckland College of Education. Charles' reports on this year are mixed. We'll focus on the highlights. He clearly enjoyed living on Waiheke Island and his two outdoor education courses were apparently brilliant, involving caving at Waitomo and kayaking the Tongariro River.

He then taught high school mathematics at Napier Boys and Christchurch Boys high schools for four years before heading off overseas for a year. He reports that it was in East Africa between standing for hours on end in an overcooked crowded bus on the road from Mombassa to Lamu, and walking in a mountain range bordering Uganda and Zaire with a three-feather sleeping bag that he thought about mathematics. Later, in Belfast he recalls skimming the mathematics textbooks at the Queens University bookshop.

After returning to New Zealand and teaching for another year at Christchurch Boys High he enrolled for an MSc at Victoria University. He chose VUW for apparently no other reason than that he fancied living in Wellington. He was attracted to combinatorics because the assignment questions involved proofs and you could sense that when you had solved the problem you really knew that you had nailed it. He did his MSc thesis and subsequently his PhD thesis in matroid theory under the supervision of Geoff Whittle. His research was in the difficult area of matroid representation theory and led to a number of publication in high quality journals. This work was quite remarkable, indeed seminal, and while over ten years old, Charles' papers from that time continue to accumulate citations. This early work also earned two prizes from the Royal Society of New Zealand - the Hatherton Award and the Hamilton Memorial Prize.

Since then Charles has continued to work in matroid theory having significant collaborations with James Oxley, Dominic Welsh and Geoff Whittle amongst others. But what is more remarkable is that matroid theory is only one aspect of Charles' research. After completing his PhD in 1998, Charles obtained a Post Doctoral Fellowship at Canterbury and moved to Christchurch to work with Mike Steel on problems in phylogenetics. While still in combinatorics, this involves a radical shift. Nevertheless, Charles has gone on to become one of the leaders in this field, where discrete mathematics is used to reconstruct and analyse evolutionary trees and networks. His work in this field began by developing new theory for combing trees into 'supertrees'. This involved not just mathematics but close interaction with biologists so he could carry out the required 'chicken scratchings' (as they call it) to help prove or disprove their latest conjecture.

In 2003, Charles co-authored a book that was the first to set out a comprehensive mathematical framework for the study of phylogenetic trees, now a standard reference in the field with 580 citations so far. More recently, he has turned his attention in phylogenetics from trees to directed networks, which seem to more faithfully represent the complexities of biological evolution. This is a field that is currently very active, and Charles has solved some outstanding problems in it, as he continues in his other roles of teaching discrete maths, and the more rarefied life as a matroid theorist. So far the two fields – phylogenetics and matroid theory – have had little or no intersection, but rumors are that this may be about to change!

Charles' move to Christchurch was productive in other ways – he and wife Brigitte have two sons and a daughter. In 2001, near the end of his postdoc at Canterbury, he secured a lectureship within the department of mathematics and statistics. In 2010, Charles was awarded the *Mathematical Research Award* by the NZ Mathematical Society for "his landmark contributions to combinatorics, and in particular matroid theory, as well as leading work in phylogenetics and computational biology," and he served as president of the New Zealand Mathematical Society over 2010-2011. In 2010, he was promoted to Professor.

Earlier we observed the Charles breaks the stereotype that mathematics is a young person's game. He also breaks the stereotype that mathematicians are quiet introverted types. Charles is invariably outgoing, talkative, good humored and cheerful. Some might even say too cheerful! Nonetheless all would agree that those who have had Charles as a student or who have worked with him as a colleague have been lucky indeed.

Geoff Whittle