NeMeSiS 2003 - An Experienced Group Perspective

We arrived in Canberra, exuberant at seeing each other again, embarrassed at not being able to remember everyone's name and eager to start. Having had such a great time last year, we were looking forward this year's NeMeSiS.

Despite trying to remain undercover among the IGs for as long as possible, our senior status was soon revealed by our uncanny friendliness, and our ability to show them the way to their rooms. Any remaining hopes we had of stealth infiltration were ruined by the addition of stickers to the EG nametags. Much to the horror of some of the tutors (ie. Norm), their nametags didn't have any such distinguishing features, thus putting them in danger of being mistaken for IGs. This was remedied by the addition of stars to THEIR nametags.

It was quickly apparent that we had been blessed with a bunch of unusually enthusiastic IGs. They had the normal strengths and weaknesses of all groups, but since one of those strengths was maths, calls of help were few and far between, thereby relieving us the embarrassment of admitting how little we remembered of last year's lectures. That said, it DID take them an awfully long time to figure out the derivations of IG, EG (inexperienced & experienced groups) and NeMiSiS, and by whom the morning lecture 'surprises' were prepared. This somewhat relieved our frustration when they didn't always laugh at our jokes ...

Despite going completely crazy over Logic and Computation when reasoning about reasoners reasoning about reasoners reasoning... (ad infinitum), being tied up in Knot Theory (putting up with (k)not-jokes), and never quite reaching the end of The Road to Catalan, we thoroughly enjoyed learning about what didn't seem like 'real maths'. Terry's Number Theory course also gave ample opportunity to catch-up on much-needed sleep - actually, we were amazed by how many new things we understood this time - and it was a relief to be able to answer questions without fear of being fined (in most cases, anyway).

A major difference between coming to the school as an EG, rather than as an IG, was the extra responsibility. We were actually supposed to look ahead for the next few days (something not practised during high school years) and deliver warnings, reminders and advertisements for social events.

Being heavily involved in organising, we somewhat neglected the mental games which are so vital to Nemesis, and it was only with a severe kick in the backside that some actually got off the ground. Schnapps was the big attraction, mostly carried by the strange-foreign-accented Norm, the unbelievably (and unfollowably) quick Ben and the also-quirky-dialect-speaking Robbie.

That takes us to the final concert which, after a hilarious dinner prank on Damjan's unfortunate tute group (soon ended by the soft-hearted and merciful Merryn [little do they know - Ed]), was three solid hours of laughter, astonishment, music, disturbance, and cross-dressing, followed by late night celebrations. All-in-all, 'twas a very fun and enjoyable evening, and a suitable end to the two weeks.

We left suffering the dreaded post-NeMeSiS-withdrawal syndrome, but also with a better appreciation for some of the more obscure areas of maths and a much stronger connection to all things NeMeSiS. Having enjoyed our two weeks so thoroughly, we know that if there were such a thing as a VEG (very experienced group), we wouldn't hesitate to join. It will always be with great overall joy that we remember our time in Canberra.

The EGs, NeMeSiS 2003:
Hayden Beck, Nick Beeton, Rhys Bowden, Anne Cumpston, Irene Doo, Megan Kwong, Clinton Mead, Katie Patterson, David Rolle, Chris Scheuber and George Young.
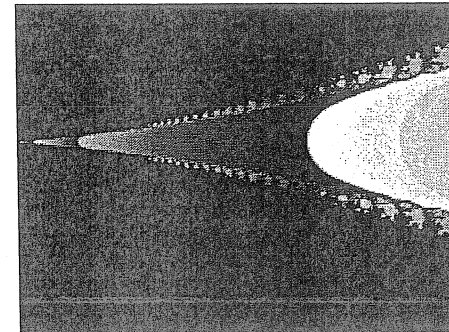
Newsletter of the National Mathematics Summer School

Bienvenue!

Welcome to the 5th edition of NeMeSiS News! If you have any questions, comments, ideas or submissions for the next issue, you can either tell Terry (terry@maths.usyd.edu.au) or contact me (merryn@nmss.org.au). Thank you to everyone who contributed.

Merryn Horrocks

From Terry

This year has been a significant one in the history of NMSS. It saw the passing of two people who made unique contributions to NMSS: Arnold Ross (1906-2002) died on 25 September, 2002 while Bernhard Neumann (1909-2002) died on 21 October 2002.

Arnold Ephraim Ross came to NMSS as a course leader in January 1975, I happened to be there in the same capacity for the first time then. Arnold had great experience of such programs in the USA and elsewhere and he set about putting his stamp on ours. He came until 1984. That last year, his wife Bee had died rather suddenly in the weeks prior to the school, yet he was there as he had arranged ... devotion to us beyond the call of duty! He had thought a great deal about the learning of mathematics with able students. He also had a long involvement with the teaching of mathematics to underprivileged inner city students.

He put in place a parallel program for the Experienced Students, his term, because he understood the importance of carrying the student traditions of the school from one year to the next. He also set about putting the academic program of the school on a surer footing. Until then, I understand, the mathematics of NMSS was not seen to be of primary importance. It was expected that students would be entertained as much as stretched academically. Today's Number Theory and Algebra course is directly descended from the course Arnold presented in 1975. He did not return to Australia after 1984, though his Summer School in America continued unabated until his death, and indeed continues yet.

Bernhard Hermann Neumann was involved with NMSS from its inception. He visited NMSS every January to talk and have lunch with the Hanna Neumann Scholar. He was a regular donor to NMSS over the years. He suggested to Larry Blaker's in 1968 that NMSS should be jointly sponsored academically by ANU and the Australian Association of Mathematics Teachers Inc, which had only just been founded, again under his urging. He was a constant friend and adviser of both Larry and me as Director. I will miss him greatly.

It was he who suggested what is now the Blaker's Lecture be by a Fellow of the Academy and it was he who presented the first one. His first talk in January 1969 was entitled a Little Geometry and he gave five Academy lectures, the last in 1992. Only death prevented his giving a sixth. I liked that last talk ... *Napoleon, my father and I.*

The last event of real significance for NMSS last year was the tragic destruction by fire of the telescopes at Mt Stomlo. We went to Stromlo on the last Thursday of the school last January, as we have done for at least 30 years now. It was a balmy evening and the mountain was surrounded by fires burning from the Brindabellas to Koszciusko, but it was obviously safe there! Not true! Two days later they were gone. They did manage to save precious data and records, but the telescopes were lost. What a gap that leaves for us. I know that they are rebuilding as I write and I am hopeful that NMSS 2004 will have some astronomical night again somewhere. But it has been a black year for them all. Those of us who recall the times spent at Stromlo as an NMSS student might like to consider making a donation to ANU to help with the cost of rebuilding.

Perhaps this is enough for now. Valé Arnold Ross, Bernhard Neumann and Stromlo.

I hope this year is an excellent year for you all.

Terry Gagen

Napoleon, My Father and I

from a talk by Bernard Neumann

If you take an arbitrary triangle–all in the plane– and erect equilateral triangles on the three sides, then take their centres and join them, you get another equilateral triangle, whatever you started with. This theorem my father had discovered when he was working on some transformer for three-phase electrical current, which had been invented in the '70s by Tesla and had developed into the natural way of transmitting electrical power. If you look at the high-tension power lines anywhere, you find they come in multiples of three except for the thin earth-wires on top, which shouldn't carry anything.

My father had published this theorem in two mathematical articles in an engineering journal before the war. At that time one still got an honorarium for publishing an article. In fact, he got an honorarium for each, and from that he had built for him a music cupboard and a music stand, both of which I still have. I knew about this theorem of his but didn't do anything about it until he wrote a book on polyphase electric currents. He had found a book by a Scottish author–in English–and asked the Springer-Verlag whether they wanted a translation of it, because it seemed interesting to engineers. They said, 'No, we want an original book. Will you write it?' So he wrote it. But this was already in the 1930s so they said, 'Sorry, we can't publish a book from a Jew. But you can have it. Do with the manuscript as you like.' So he brought the manuscript with him to Wales when he and my mother came, translated it into English and offered it to a publisher. It was published late in '39, in English. I read the proofs of it, just to help him, and that reminded me of this theorem, which I thought surely must be capable of generalisation to other polygons in the plane. I

found that generalisation, wrote it up as a paper and then, much later, after I'd already given some talks on it–it's very suitable for a popular talk–I found that somebody had called it Napoleon's Theorem. Since then, many historians of mathematics have been trying to trace it back to Napoleon, without success. It is known that Napoleon was very mathematically inclined and had many mathematicians round him*, and it is entirely possible that he knew about the theorem and may even have found it, but there's no proof of that. The first reference that I now know of dates from 1826 but the first ascription to Napoleon dates from about the turn of the century. So that is why I call the lecture 'Napoleon, My Father and I'.

*Napoleon removed the famous mathematician Laplace as Minister of the Interior in his government in 1799 after only six weeks, remarking that he had `brought the spirit of the infinitely small into the government!'

Fun with ciphers ...

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from *The Code Book* by **Simon Singh**, 1999.

Thanom Shaw attended NMSS as a student in 1999 and 2000. She has been for the last two years as a tutor, and will be back again next year. What made her come to NMSS in the first place, and what makes her keep going back? Here's what she said.

How did you come to attend NMSS?

I like to say that my official anniversary for becoming a maths nerd was April 1998. It was on this day that I went to my first maths camp (an olympiad camp, where I was the ONLY girl), where I met other maths nerds. They were dumbfounded that I had never heard of NeMeSiS and made it their mission to get me invited. They made it sound so enticing - apparently you learnt heaps of cool maths, there were girls as well as guys (and hence gossip), and it was just the place to be over summer! And so I entered the J.L.Williams competition (by which NSW people generally get invited). I remember staying up until 4 a.m. writing, and rewriting, my proof to why equilateral triangles tessellate (I'm serious!) because I was so worried it wasn't perfect and that I wouldn't get invited. After all that worrying, I ended up caning the competition and getting invited to NeMeSiS. YAY!
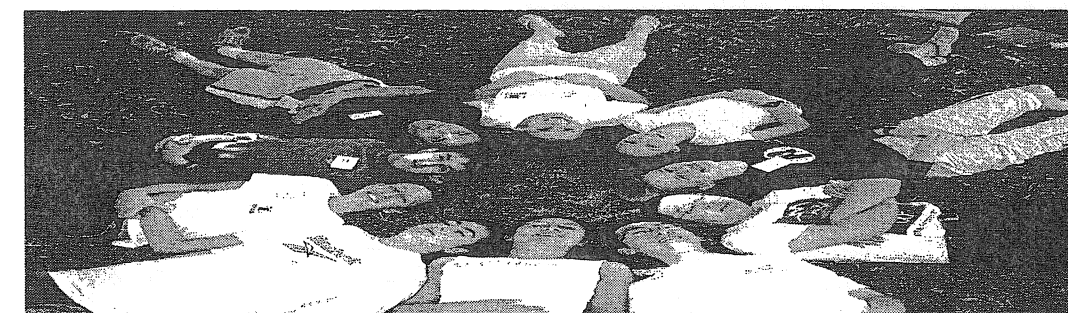
What is it about NMSS that makes you want to spend your holidays there?

Everything. Or maybe everything except the food - but even that is sometimes better than the things that come out of my kitchen! The maths is cool and the way the maths is taught is cool.

But of course, above everything else, it's the people. All these like-minded people in the same spot, dining together, conversing, exchanging ideas, having fun and even falling for each other! They are what cause that empty feeling you get for ages after you've come home, and they are what make you want to come back time and time again!

What's your most memorable NMSS moment?

That's a hard question! I've had heaps of memorable times at NeMeSiS, but probably the most memorable MOMENT would have been watching Ben (lecturer) in a mobius strip boob tube, with very spherical and polystyrene-like breasts, standing on a chair, puffing his chest out, singing at the top of his lungs, in falsetto, "My Heart Will Go On" ... yeah, that was quite memorable!

What are you doing when you're not at NMSS?

This year I am doing honours in biochemistry (under the supervision of Prof. Kuchel, who gave a talk at NMSS98 on clocks), because it's so interesting and explains so many quirky things that happen inside us and other living things. What I am trying to do is form a mathematical model of what goes on inside red blood cells under certain conditions. If I put (my own) red blood cells inside a really big fancy magnet (NMR spectrometer), I can actually monitor lots of stuff going on inside them–which is pretty cool. It's also cool that I can truthfully say I poured my blood, sweat and tears into this project.

"How I want a drink, orangeade of course, after the heavy lectures involving numbers algebraic. IGs or EGs thinking most deeply of simply NMSS!"