László (Laci) György Kovács
1936–2013

Laci Kovács arrived in Australia in October 1963 to take up a position as Fellow in the newly-created Department of Mathematics in the Research School of Physical Sciences at the Australian National University in Canberra. Laci quickly adapted to living in Australia and became a citizen as soon as he could. He was rapidly promoted to Senior Fellow, a position he held till his retirement in 2001. He continued his association with the ANU as a Retired Visiting Fellow (in the Mathematical Sciences Institute) until his sudden death on 28 July 2013 during a visit to Brisbane for a family birthday. Laci was a very talented mathematician. He was a problem-solver and communicator par excellence. Laci was fortunate to be able to make a career exercising these talents. He amply repaid that good fortune in a generous and unassuming way.

Laci was born on 18 August 1936 in Budapest, Hungary, as the first child of József, who was a theologian and a minister in the Reformed (Calvinist) church and Erzsébet (Bertók) who was also a theology graduate. Both his parents had done further study of theology in Scotland. His maternal grandfather was a bishop in the Reformed Church at Munkács (now Mukacheve). His other grandfather was a school teacher. Laci is survived by two siblings who live in Hungary. In 1941 József became a pastor in Munkács when his father-in-law retired. In 1944 the Soviet Union took over Munkács and Laci had to go to a Ukrainian elementary school. It was there he was drawn to mathematics by seeing a goniometer. Its use was explained to him as a reward for doing his Ukrainian homework. In 1949 József became a pastor in Debrecen, which had been the centre of the Reformed Church in Hungary.

From 1950 to 1954 Laci attended the Gymnasium (grammar school) of the Reformed Church in Debrecen. There he expanded his interest in, and skills at doing mathematics through KöMaL (the Mathematical and Physical Journal for Secondary Schools), which had been founded in 1894 and was circulated monthly

to schools in Hungary. These skills were further enhanced through regular extra-curricular sessions provided by some of the mathematicians at the university, including the algebraists Tibor Szele and Andor Kertész. Laci had solutions published in KöMaL from 1951. With another student he wrote a half-page in KöMaL encouraging other young people to take part in such activities. In 1954 he became one of the prizewinners in the Kürschák competition, a famous competition started in 1894 whose winners included people like Szegő, Haar, Fejér, Riesz, and Teller. During his school years Laci developed a love for opera, music and literature. He learnt English privately. Before entering university he was awarded an Honorable Mention in the Miklós Schweitzer Memorial Competition, on which the Sydney University Mathematical Society Problem Competition is modelled.

Laci went on to study mathematics, physics and education at the Lajos Kossuth University in Debrecen. He continued to be successful in the Schweitzer competition gaining outright first prize in 1954 and sharing first or second prize in 1955, 1956 and 1957. Quite a few of his solutions were published, illustrating that he had already developed a polished style of presentation. At university Laci was strongly influenced by Szele and Kertész. His research career began as an undergraduate leading to a paper on regular rings and one on abelian groups. Sadly Szele died in 1955 at a young age. Laci wrote an obituary in KöMaL. Kertész also died quite young. At a meeting in Debrecen to mark the 80th anniversary of Kertész' birth, Laci presented a warm tribute to his mathematical and personal guidance. Laci completed his studies in 1958, qualified to be a secondary school teacher of mathematics and physics.

At the university, Laci was a Demonstrator and Assistant in Mathematics. In the latter position he helped with editorial tasks for *Publicationes Mathematicae.* He proved to be outstanding at editorial detail. During his time there a Hungarian translation of Kuroš' influential Russian text on the theory of groups was prepared, together with the appendix written for the German edition by B.H. Neumann. Laci had a copy of the Hungarian edition in his office at ANU. It contains his editorial markings especially on the appendix.

Reading the appendix is most likely what drew Laci to seek to study with Bernhard Neumann in Manchester. He was able to do this in 1958 with support from a Research Studentship given to him by the University College of North Staffordshire, now the University of Keele. He lived in Keele for the first two years of his time in Britain and had James Wiegold as local supervisor. While at Keele he used his training to teach at a local secondary school for girls, Goudhurst College, to familiarise himself with English usage in school mathematics. His general English improved quickly. His written and spoken English became, apart from a slight accent, more fluent, wide-ranging and nuanced than many native speakers. This can be observed from his publications especially in the surveys.

Laci spent the summer of 1960 in Tübingen in Germany studying under Helmut Wielandt.

After successfully completing a Master's degree with a thesis on *Groups with Regular Automorphisms of Order Four* and a doctorate with a thesis on *Groups with Automorphisms of Special Kinds*, Laci was appointed to be an Assistant Lecturer at the Victoria University of Manchester in 1960. He was promoted to Lecturer in 1963. He gave an invited address at the British Mathematical Colloquium in 1961.

The political turmoil in Hungary meant that Laci did not return there for about 20 years. After that he returned quite frequently. An honorary doctorate was conferred on him by the University of Debrecen in 2003. The citation notes, among other things, his long and continuing association with the University. He also resumed his editorial association with *Publicationes Mathematicae*; there is a tribute to him in Volume 83.

Laci came to ANU to work in a team being built by Bernhard Neumann. He proved to be a very good team player. During his long career at ANU he supervised about 20 doctoral students and had a strong influence on many other students. He gently encouraged young algebraists who held positions at ANU and interacted actively with visitors to ANU. This is shown by the long list of people with whom he wrote papers and the acknowledgements of his help in many other papers. He examined externally for higher degrees both nationally and internationally.

Visits overseas were an important part of working at the ANU. For Laci such visits included extended stays in New York; in Manchester and Oxford; in Milano, Padova and Firenze; in Debrecen; in Essen; and at the Mathematisches Forschungsinstitut at Oberwolfach in Germany under the Research in Pairs scheme. They also included many other meetings at Oberwolfach, two International Congresses of Mathematicians (Vancouver 1974, Berkeley 1986) and conferences/workshops in the UK, Germany, USA, Canada, Hungary, Ireland, Italy, Korea, Norway and New Zealand.

On these visits he gave many seminar talks. Laci was a lucid and well-organised lecturer. He preferred to use blackboards and then to use them sparingly. He was an artist in this medium. He took care about what went on the board and where it was placed. He has been known to give a 40-minute lecture using just one well-constructed board. Laci was able to communicate mathematics clearly enough to allow discussion by phone. His phone could be engaged for longish periods.
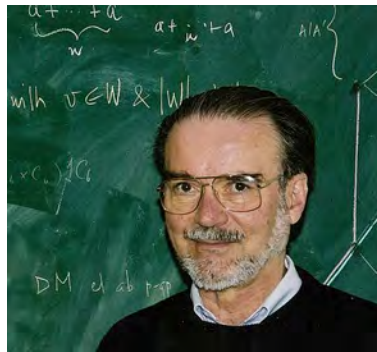
In more recent years he taught at several summer graduate schools in Italy. In these he developed a great rapport with many of the students. To quote from just two of them who had continuing association with him: 'Laci has been much more than a supervisor or a friend for me, he has been something like a father, or

even more. His influence on me has been very strong in many respects, of course the scientific one, but this is certainly not the most important.' 'Laci's life is an inspiration for many of us.'

Laci was a problem solver rather than a theory builder, though of course he often turned the art into science. He brought with him to Australia, and disseminated, the problem solving and expository skills he had learnt in Hungary. His research was characterised by his approach to problem solving and the clarity and care of his reporting of the results. This involved careful analysis of his arguments to reveal their essence and often to show the way forward to simpler and more general results. Here I can do no more than hint at some of his contributions. I should mention his ubiquitous use of lattice diagrams to guide and illustrate his thinking — such a diagram can be seen in the last photo.

In his last year in Manchester, Laci attended a course of lectures on varieties of groups by Hanna Neumann. These were preparation for her now well-known and influential monograph *Varieties of Groups*, which she wrote in Canberra. As that book shows, Laci played a significant role in improving our understanding of varieties in the 1960s. This was the subject of his invited address to the annual meeting of the Society in 1967. During the 1970s this successful era was summed up by Laci in several surveys. The one in a volume to mark Bernhard Neumann's 70th birthday was a timely and beautiful account. There has been only somewhat limited progress on varieties since then.

In the process of his work on varieties, and other problems, Laci developed an excellent understanding of modular and integral representations of groups. He continued to develop his understanding of these representations and produced many useful results about them often stimulated by questions from others. He was attracted to other problems where his techniques could lead to worthwhile contributions. For example, his investigations into maximal subgroups of finite groups led to a definitive account of primitive permutation groups. This account underlies theoretical treatment of primitive permutation groups and the algorithms behind handling these groups in the computer algebra system Magma. His interest in representations drew his attention to modular Lie representations from the late 1970s. This went on to be the dominant topic of his research, in a team, from the mid-1990s. It had an emphasis on representations of general linear groups. However the highlight has been a complete decomposition theorem for Lie representations for a cyclic group of prime order p in characteristic p.

Laci often responded to questions with well-polished letters. A typical example is a letter to Charles Curtis on a lemma of Brauer which was published by the *Bulletin of the London Mathematical Society* on the advice of a perceptive editor. Some of his work appeared only in research reports at ANU; yet he published more than a hundred papers, over more than half a century, mostly on groups and Lie algebras and their representations. Among the others is a paper with John Burns on the bisection of a quadrilateral by a line through a vertex. This reflects his continuing love of problems in Euclidean Geometry and his work with beginners in mathematics.

As well as his research and teaching of graduate students, Laci from time to time taught undergraduate courses. Laci served many terms as acting head of the Department of Mathematics. He was a sound though somewhat reluctant administrator. Laci played a significant role in the organisation of three international conferences on the theory of groups: in 1965 — the first international conference in Australia on a mathematics topic — he was 'the tireless secretary', in 1973 and in 1989 — to mark B.H. Neumann's 80th birthday. He helped edit the proceedings of the first and single-handedly edited the proceedings of the third. He helped organise a Summer Research Institute of the Society on Algebra at ANU in 1978.

Laci wanted to spread the experience of doing mathematics that he enjoyed as a school student. So in 1965 he and I started a series of mathematics enrichment evenings for high school students in Canberra. He was active in these for more than 25 years. They still continue in other hands. He helped Peter O'Halloran with the founding of the Australian Mathematics Competition and with Olympiad activities. Laci was one of the first recipients of a BH Neumann Award for important contributions over many years to the enrichment of mathematics learning. For a number of years he taught at the AAMT-ANU Summer School for talented high school students.

Laci was founding Associate Editor for the *Bulletin of the Australian Mathematical Society* (1969–1979). Its early success in nearly meeting Bernhard Neumann's editorial dream of speedy publication was significantly enhanced by Laci's work in that role. The *Bulletin* has become an internationally respected journal. He was Associate Editor for non-commutative algebra for the *Journal of the Australian Mathematical Society Series A*. He served on the editorial board of *Publicationes Mathematicae* from 2001, that of *Communications in Algebra* (1985–1990), that of the *Journal of Group Theory* (1997–2001) and that of *Periodica Mathematica Hungarica* (from 1998). He was an advisor for the ANU subseries of the Springer *Lecture Notes in Mathematics*. His editorial expertise expanded to becoming an expert in TeX and its various dialects.

He was honoured with a special issue of *Journal of the Australian Mathematical Society* to mark his 65th birthday.

Laci married Alison Ashbrooke in England. They had three children, Ilona, Piroska and Michael. In the early 1970s Laci and Alison separated. He continued to take an active part in raising the children. In the early 1980s he found in Margaret Oates someone with whom he shared a deep love of music. They married and continued their concert- and opera-going together in many places around the world. Laci combined his interest in mathematics and in music by giving technical support to Margaret for lectures she has given and to many others with his expertise in hi-fi and recording. It was a great pleasure to him that Margaret also shared in his wider mathematics family. They were generous hosts to many mathematical visitors. Through Margaret, Laci expanded his appreciation of wine, food and art. These became an increasingly important part of their trips to Europe. He was particularly fond of the culture and people of Italy. He took an active interest in his grandchildren.

The sense of loss felt on his death is well summed up by his former student (now Sir) Michael Brady who wrote: 'I learned so much from Laci, only some of it from Mathematics. What a truly lovely, gentle man.'

Many, I in particular, will very much miss his love for and enjoyment at doing mathematics, his encyclopaedic knowledge and his sage and willingly-given advice. Sadly this document suffers from lack of his critical input.

I am indebted to and thank Laci's family: Margaret, his brother Peter and his son Michael, for help with the personal background; and others especially Csaba Schneider and George Berzsenyi for help with Hungarian background and Hungarian; and Cheryl Praeger and Ralph Stöhr for help with mathematics background.

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