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Hyam Rubinstein

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J. (Joachim) Hyam Rubinstein was born March 7, 1948, in Melbourne, the third of six children, all boys. His father Tony was born near Bialystock in Poland where his father (also Joachim Hyam) had a lumberyard, and was also known as a great scholar and ran a Yiddish newspaper. When the family emigrated to Australia in the 1930s, Tony became a publisher and printer who operated York Press, expanding the local Jewish community and Yiddish newspaper for more than thirty years.

Hyam and his brothers were strongly influenced by their mother Gertrude Rabinov, who left Russia with her parents for Palestine around 1900 and then moved to Australia during World War I. Gertrude was a brilliant student who placed first in the Victoria State school examinations in science, and who entered university at age 16 (she was asked to repeat year 12, to avoid entering university at a too young age of 15). She completed an MS degree at Melbourne University in physical chemistry, and then devoted herself to her family. She encouraged her sons to study science and mathematics, and later completed a second University of Melbourne MS degree in zoology. Working as an assistant at the Department of Psychiatry, she later published about a dozen papers concerning the genetic basis of mental diseases, especially schizophrenia.

All of Hyam's brothers exhibited mathematically ability, in addition to being enthusiastic chess players. The oldest, Martin, studied math, went to Berkeley at age 19 and then to a career at IBM in White Plains, NY. The next oldest, David, got degrees in physics and engineering, but sadly became schizophrenic. After Hyam was Jeffrey who was a pianist, often playing for the ballet. Simone learned statistics, became a successful professional gambler and also a printer. Ian was the youngest and went into business with a sideline as a golf instructor.

Even before becoming a teenager, Hyam received highest recognition for academics, and for mathematics in particular. In 1959, at age 11, he was awarded the John Braithwaite Scholarship. He entered Melbourne Boys High School, and at age 17 placed first on the Victoria State list of matriculation-exhibition winners, topping the general exhibition, with exhibitions in calculus, applied mathematics, and physics, and winning the B.H.P. Matriculation Prize. He graduated from Melbourne Boys High School in 1966, winning the prize for pure mathematics, physics and chemistry in his final year.

Hyam went on to Monash University, where he majored in pure mathematics and statistics, and earned a B.Sc. Honors (First Class) in 1969. He followed his older brother Martin, obtaining a Fulbright travelling scholarship to attend the Berkeley campus of the University of California, planning to do graduate work in algebraic topology. At Berkeley, Hyam was influenced by the work of John Stallings in geometric topology and became a student of Stallings. While at Berkeley, he was supported by an IBM Fellowship and received three distinctions in the qualifying exams. He completed his thesis and was awarded a

Ph.D. in Mathematics in 1974. His thesis was titled, "Isotopies of Incompressible Surfaces in Three Dimensional Manifolds."

Hyam married Sue Bernshaw in 1970 just before leaving for the US. Sue had completed an honours degree in biochemistry at Monash, and later did a graduate degree in accounting, working as company secretary for Hyam's father. Hyam and Sue decided to return to Australia upon the completion of his doctorate. Hyam accepted a postdoctoral appointment at the University of Melbourne. Following this, in 1978, he was appointed as a lecturer and received tenure at Melbourne University in 1980. Leon Simon held a chair in the Department at the time, and when he left Melbourne for ANU in 1980 he suggested that Hyam apply for his chair. This succeeded, and in 1982 he became a Professor of Mathematics at Melbourne at the age of 34. As of 2014 he continues in that position. He has also been a member or Visiting Professor at the Mathematical Research Institute, Berkeley, the Institute for Advanced Study, Princeton, Stanford, the Technion, Oklahoma State University, University of Paris VI, the University of California at Davis, and the Mathematical Sciences Research Centre at Tsinghua University.

Following a suggestion of Leon Simon, Hyam and Jon Pitts, a geometric measure theorist at Texas A&M University, began a collaboration that integrated the sweep-outs and minimax methods of geometric analysis into 3-manifold topology. Combinatorial versions of these ideas played a key role in Hyam's later work on almost normal surfaces and 3-sphere recognition algorithms.

This was followed by many successful collaborations: on PL minimal surface theory and on 3-manifold triangulations with William Jaco, on polyhedral differential geometry with Iain Aitchison, and on the structure of Heegaard splittings with Marty Scharlemann. He worked with Joel Hass and Peter Scott on applications of minimal surface theory in 3-manifolds, and with Ben Burton, Craig Hodgson and Stephan Tillmann on connections between the geometry and topology of 3-manifolds. In the late 1980s, Hyam began working with Doreen Thomas on shortest networks, leading to a breakthrough on the Steiner ratio conjecture. A group emerged from this direction working on the design of shafts in underground mines. Hyam's organizational and scientific skills combined, and he became the Managing Director of the MineOptima group, which has produced software applying new optimization algorithms for the design of underground mine access networks.

Hyam also has a notable collaboration with his son Ben Rubinstein, who obtained a Ph.D. in computer science at Berkeley. This collaboration has brought geometry and topology into the science of machine learning, which is Ben's specialty. Ben began a tenured position in the University of Melbourne Computer Science Department in 2013.

Hyam's work has earned widespread recognition. He is a Fellow of the Australian Academy of Sciences, the American Mathematical Society, and the Australian Mathematical Society. He was awarded the Hannan Medal by the Australian Academy of Sciences for exceptional mathematical research and the Australian Mathematical Society's George Szekeres Medal for outstanding contributions to the mathematical sciences. He served as president of the Australian Mathematical Society, Chair of the National Committee for the Mathematical Sciences, and Chair of the Working Party of the National Strategic Review of Mathematical Sciences Research in Australia.

Hyam is currently a Professor in the Department of Mathematics and Statistics at the University of Melbourne in Melbourne, Australia. His son Ben and daughter-in-law Juliet have two children Ella and

Liam. Juliet holds a Ph.D. in Electrical Engineering from Berkeley, completing the family connection to Cal.

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