NATHAN MENDELSOHN, SCHOLAR 1917-2006. Absent-minded polymath who taught mathematics at the University of Manitoba for 57 years made his name in combinatorics, a dazzling bit of science that no Sudoku puzzle can be without

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TORONTO -- **Nathan Mendelsohn** may well have been the absent-minded professor from central casting. He would go to work by car and return home by bus. His wife would send him shopping and he would come back with the wrong items ("I'll cook what he brings," she once said with a shrug). And there was the time he took his family to the movies and agreed to stand in the rain to buy the tickets while his wife and two sons took shelter indoors. **Prof. Mendelsohn** decided he didn't want to see the movie after all, so he drove home.

Then there was the brilliant mathematician who saw beauty in the abstract. The Order of Canada member who made his own furniture, jewellery and wine, and delighted in performing hypnosis and magic tricks. The one who never wrote anything down because he didn't have to. With his sly sense of humour, he would appreciate the designation of polymath.

Prof. Mendelsohn taught mathematics at the University of Manitoba for 57 years, ending his career in 2005 as distinguished professor emeritus. He headed the math department for about 20 years, authored 140 research papers — about double the average professor's career output — and was a leading light in a branch of pure mathematics called combinatorics, which deals with the abstract relationships of objects to each other. One application is the math that underlies the popular Sudoku puzzles.

His and others' theories bore practical applications in such areas as scheduling, cryptography and software testing, often decades after they were promulgated. Helen, his wife of 62 years, had another name for her husband's work: "dreamy mathematics" (though she had no qualms pronouncing that she "really" hated math).

Prof. Mendelsohn worked in other fields of mathematics, including computing and numerical analysis, graph and design theory, and many branches of algebra. But it was combinatorics for which he was best known.

"It is probably safe to say that there is not a combinatorialist or universal algebraist in the world who has not heard of **Nathan Mendelsohn**, and that probably very few of them have not quoted at least one of his papers or worked in an area of research which he has helped develop," stated the Royal Society of Canada in awarding the Henry Marshall Tory Medal to **Prof. Mendelsohn** in 1979.

Mathematics, he declared in a 1985 National Film Board short, "is my vocation, my avocation, my hobby, my playground. I do other things for relaxation — I enjoy them — but my greatest pleasure is working with mathematical concepts."

He first encountered that pleasure in Grade 3 when he became aware of two things: the power of immediate recall, and that he knew more math than his teacher did without really trying.

His father, Sam, an ironworker, came to Toronto with his four children in 1918 to join relatives after they had been burned out of their tenement in Brooklyn. The clan settled on Euclid Avenue, and its descendants note the connection to the ancient Greek mathematician.

Young Nathan amused himself by taking apart clocks (usually putting them back together). He was awarded a four-year scholarship to the University of Toronto, where he completed bachelor's and master's degrees and, in 1941, his doctorate.

While still an undergraduate, he belonged to the team that won the William Lowell Putnam Mathematical Competition, said to be the toughest math test in the world. Meantime, he was advised to take up magic as a way to calm tremors in his hands, and he studied the hucksters and pitchmen at the Canadian National Exhibition. His sleight of hand landed him second prize at an International Brotherhood of Magicians contest, just behind a young amateur named Johnny Carson.

But there was a war on, and **Prof. Mendelsohn**'s talents were needed in defence research. He was enjoined from talking about the work — he volunteered bits and pieces much later — but his family believes it involved code-breaking and artillery simulations, continuing the age-old use of mathematics for military applications. (A similar stint in the early 1960s at the Rand Corp. was even more hush-hush.)

At war's end, he headed to Kingston, Ont., to teach at Queen's University, where he stayed for three years. Asked about the short interval, his son, Eric, a professor of math at the U of T, explained: "He understood that, as a Jew, he would never get a permanent position. Queen's already had a Jewish professor in the department."

So he settled in Winnipeg, where the University of Manitoba welcomed any and all to build its fledgling math department, and where **Prof. Mendelsohn** became deeply involved in the city's vibrant Jewish community. Raised in a modern Orthodox family, he was drawn more to Judaism's teachings on morality than its ritual. Evidence for the existence of God, he reasoned, was "circumstantial" — not quite enough for a scientist.

But with a salary of about $3,000 a year, he was forced to work during the summers, driving to Quebec City with his family for teaching jobs.

He first came to international notice after co-authoring a paper in 1961 on Latin squares — grids in which no two numbers may appear in the same row or column (essentially a numeric Sudoku puzzle). Tough enough on a standard 9x9 grid — but **Prof. Mendelsoh**n raised eyebrows by successfully constructing five pairs of 12x12 grids. Visualized in three dimensions, with each grid placed over its pair, the numbers repeated neither in rows and columns nor up and down. And it was all done without a computer.

"That was absolutely extraordinary," said Michael Doob, whom **Prof. Mendelsohn** hired to teach math at the University of Manitoba. "He was known for idiosyncrasies, but he taught without any notes at all. And I don't think he had a mean bone in his body. He was a real mensch."

Prof. Mendelsohn forged friendships with some of the leading names in the rarefied world of higher math, including the eccentric Hungarian number theorist Paul Erdos, who made a habit of showing up on fellow mathematicians' doorsteps unannounced and with no money.

Prof. Mendelsohn also built his own cabinets. "He'd make four or five pieces of furniture and then stop," his son recalled. "He was like that with math, too. He was more interested in finding a new problem and solving it than worrying about one classical problem."

Two modern theories bear **Prof. Mendelsohn**'s name. Both of them, said his son, are "just a genius's slight twist on an old idea to get mathematics to give up one of her profound secrets."

Prof. Mendelsohn guided graduate students until a year ago, and he never stopped doodling on the proverbial napkin. The page proofs for his last paper arrived the morning he died.