IN MEMORIAM

Irving Kaplansky
Professor of Mathematics, Emeritus
UC Berkeley
1917 – 2006

Irving Kaplansky, known to his friends as Kap, was born on March 22, 1917 in Toronto, the youngest of four children. His parents had recently emigrated from Poland, where his father Samuel had studied to be a rabbi. In Toronto Samuel worked as a tailor, while Kap's mother established a chain of Health Bread Bakeries that ultimately supported the whole family. Kap died on the 25th of June 2006, at his son Steven's home, in Sherman Oaks, California.

Kap's mathematical talent was apparent early. From 1938 to 1939 he attended the University of Toronto, where he got his bachelor's and master's degrees (1938-39). He was one of the two Putnam Fellows in 1938, the first year of that most prestigious of all North American undergraduate mathematical competitions. Kap went to Harvard University and received his Ph.D. there in 1941, working under Saunders MacLane. He was Benjamin Peirce Instructor at Harvard from 1941 to 1944, and then joined the Applied Mathematics Group doing war work at Columbia University from 1944 to 1945.

After the war, Kap joined the Mathematics Department at the University of Chicago, where he was chair of the department from 1962 to 1967 and George Herbert Mead Distinguished Service Professor from 1969. He retired from the University of Chicago in 1984 in order to become the second director of the Mathematical Sciences Research Institute (MSRI) in Berkeley, established just a few years before by Shiing- Shen Chern (its first director), Calvin C. Moore, and Isadore M. Singer. He was appointed as professor of mathematics at UC Berkeley at the same time. In 1985-86, he served as president of the American Mathematical Society.

During his lifetime, Kap received many professional honors and recognitions. These include the Quantrell Award for Excellence in Undergraduate Teaching at the University of Chicago (1961) and the Steele Prize (Career Award) from the American Mathematical Society (1989). Kap was elected to the American Academy of Arts and Sciences in 1965, and to the National Academy of Sciences in 1966. He received two honorary degrees: Doctor of Mathematics from the University of Waterloo, and Doctor of Science from Queen's University, both in 1968.

Kap was proud of the fact that he was one of the first to suggest to the National Science Foundation (NSF) the founding of new mathematics research institutes beyond the Institute for Advanced Study in Princeton. Already in the 1960s he had told an NSF panel that the growth of U.S. mathematics made the creation of such institutes in the Midwest and on the west coast an important priority. Kap led MSRI until 1992, overseeing its move from its temporary quarters to its spectacular permanent location above the campus, and putting many MSRI traditions in place. Among his many long- term contributions to the life of the institute was the creation in 1986 of a group of Friends of MSRI that included James H. Simons, William Randolph Hearst III, Elwyn

R. Berlekamp, and Steven Wolfram, three of whom subsequently became trustees and major contributors to MSRI.

Kap retired as director of MSRI and as professor of mathematics in 1992, but came to his office at MSRI to do research every day and attended every colloquium at Berkeley until he became ill in 2005. A man of extraordinarily regular lifetime habits, he unfailingly took the same bus down from MSRI for his daily swim. He remained active in mathematical research and publication until just eight months before his death.

In all Kap wrote some 151 journal articles (the last published in 2004) and 11 books. His mathematical interests were extraordinarily broad, and his papers touch on topological algebra and operator algebras, the arithmetic and algebraic aspects of quadratic forms, commutative and homological algebra, noncommutative ring theory and differential algebra, Lie theory, combinatorics and combinatorial number theory, infinite abelian groups, linear algebra, general algebra, game theory, probability and statistics. Among his most important papers were those on topological algebra and operator theory published in 1948-1952, and those on noncommutative ring theory, such as the classic "Rings with a Polynomial Identity" (Bulletin of the American Mathematical Society 1948), which started a whole field. His books became legendary for their clarity, style and brevity.

The interest and skill that Kap showed in teaching is suggested by his books, but demonstrated by his mentoring of Ph.D. students. Fifty- five received their degrees from him between 1950 and 1978, and their work proved fertile: as of this writing (summer 2007) Kap's "mathematical family," consisting of students, grand- students…, has at least 627 members. Joe Rotman, one of Kap's students, wrote:

"Every course, indeed, every lecture, was a delight. Courses were very well organized, as was each lecture. Results were put in perspective, their applications and importance made explicit. Humor and droll asides were frequent. Technical details were usually prepared in advance as lemmas so as not to cloud the main ideas in a proof. Hypotheses were stated clearly, with examples showing why they were necessary. The exposition was so smooth and exciting; I usually left the classroom feeling that I really understood everything. To deal with such arrogance, Kap always assigned challenging problems, which made us feel a bit more humble, but which also added to our understanding. He was a wonderful teacher, both in the short term and for the rest of my mathematical career. His taste was impeccable, his enthusiasm was contagious, and he was the model of the mathematician I would have been happy to be."

Kap was not a naturally sociable person before his marriage, but his world was vastly enriched when he married Chellie Brenner in 1951. Chellie and Kap had three children, Steven, Alex and Lucy. Chellie was Kap's opposite in terms of outgoing open warmth. Chellie brought streams of friends and colleagues into their home, and in the years of Kap's directorship at MSRI she presided as a mother hen over the many visitors as well as over Kap himself. When Chellie became ill in the last part of Kap's life the tables were turned, and he nursed her faithfully.

Kap was entranced by music very early. He wrote, "At age 4, I was taken to a Yiddish musical, Die Goldene Kala. It was a revelation to me that there could be this kind of entertainment with music. When I came home I sat down and played the show's hit song. So I was rushed off to piano lessons. After 11 years I realized there was no point in continuing; I was not going to be a pianist of any distinction….I enjoy playing piano to this day. … God intended me to be the perfect accompanist – or better, the perfect rehearsal pianist. I play loud, I play in tune, but I don't play very well."

Nevertheless, his playing was greatly enjoyed by his friends and family, and later by his colleagues at MSRI, where he would play at Christmas parties and other occasions. His daughter Lucy became a well- known folksinger- songwriter, and he sometimes accompanied her concerts, for example at Berkeley's Freight and Salvage. She wrote that "[f]rom as early as I can remember I would sing while he played the piano. He taught me dozens of songs from the 1930s and '40s, as well as from Gilbert and Sullivan operettas. I still remember most of these songs."

Kap's musical interest was centered on Gilbert and Sullivan, and on popular songs of the "golden age", about 1920-1950. He composed a number of songs and was proud of a musicological observation about songs of this period:

"Most had the form AABA. I noticed there was a second form ("Type 2") AA'BAA'BA". A: 4 bar theme; A', A": variants; B: contrasting 8 bar theme. (Though I assumed any jazz musician knew about this, nothing

about it was found in the literature.) Type 2 is really better for songs. (In Woody Allen's Radio Days, the majority of the 20 songs are Type 2.) As proof I tried to show that you could make a passable song out of such an unpromising source of thematic material as the first 14 digits of π." Enid Rieser produced lyrics, and Lucy often performs this song on her tours.

Kap is survived by his wife Chellie, his children Alex, Lucy and Steven, and by his grandchildren Aaron and Molly.

David Eisenbud*
Tsit- Yuen Lam

* The authors are grateful to Hyman Bass, from whose account at http:// www.msri.org/ calendar/ attachments/ specialevents/270/ Kap- BassPresentation_MSRI_022307_fin.pdf many of the quotes and facts above are taken.