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In Memory of Kai-Lai Chung

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Abstract Kai Lai Chung (1917-2009), a Chinese-born mathematician, a world renowned expert in Probability Theory. He was born in Shanghai, and graduated from South-western Associated University, 1940 in Kunming, and got Ph.D. from Princeton University (USA) in 1947. He had worked many years as a full professor at Math. Dept. of Stanford University (USA) since 1960's, and became a professor emeritus after his retirement. He made various unforgettable important contributions to Markoff chains as well as to the theory of stochastic processes. He had been the adviser of our JMRE (Journal of Mathematical Research and Exposition) for 29 years, and as a matter of fact, the name of our journal was devised and suggested by him in 1981. Certainly, the passing-away of Chung is really a great loss to the community of Chinese mathematicians and also to the world of probabilists.

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Kai Lai Chung had been an adviser of JMRE for 29 years, and was born in 1917 in Shanghai, China. His family home though was in Hangzhou in Zhejiang Province. He entered Tsinghua University in 1936 and first studied physics but graduated in mathematics in 1940. During the war with Japan, major universities in the Beijing-Tianjin region moved to the southwest city of Kunming and regrouped as the National Southwestern Associated University and Chung worked there in a position analogous to that of assistant professor. During this period, he first studied number theory with Lo-Keng Hua and then probability theory with Pao-Lu Hsu. In 1944, Kai Lai Chung won a highly competitive Boxer Rebellion Indemnity scholarship for study in the United States and he arrived at Princeton University in December, 1945. Hecompleted his Ph.D. at Princeton in 1947 with Harold Cramer as advisor (Cramer was visiting Princeton at the time -S. Wilks and J. Tukey were the other members of the dissertation committee). Chung's thesis was entitled "On the maximum partial sum of sequences of independent random variables".

Kai Lai Chung subsequently held academic appointments at the University of Chicago, Columbia University, University of California at Berkeley, Cornell University and Syracuse University. He moved to Stanford University in 1961 and was emeritus Professor of Mathematics at Stanford. Over the years, he held extended visiting appointments at several institutions: University of Strasbourg (France), University of Pisa (Italy), and the ETH (Eidgenossische Technische Hochschule) of Zurich (Switzerland).

Kai Lai Chung taught probability for over 30 years and supervised 14 Ph.D. students. The Mathematics Genealogy project currently lists a total of 112 academic descendants for him.

Kai Lai Chung played an influential role in the development of probability theory in his native China immediately after the chaotic years of the Cultural Revolution (1966-1976). His visit to China in 1978 (together with J. L. Doob and J. Neveu) was the starting point for renewed contact of Chinese probabilists with the West. He has visited China many times since then, given numerous lectures and short courses, (e.g., at Dalian University of Technology and Huazhong University of Science & Technology, etc.), and helped young Chinese scholars gain opportunities to study in the United States.

Kai Lai Chung (1917-2009) in Memoriam

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The passing of Kai Lai Chung (钟开莱) on 1 June 2009 at the venerable age of 91 reminds me forcibly of the importance of Chung's work in my own life.

Chung posed a combinatorial identity as Problem 4211 in the American Mathematical Monthly, Vol. 53 (1946), Aug.-Sept. issue, p.397, which remained without a published solution until I published a solution ten years later. See Amer. Math. Monthly. Vol. 63 (1956), Feb. issue, pp. 126-127, where the reference is to my paper "Some generalizations of Vandermonde's convolution" in same issue of the Monthly, pp. 84-91. This was the second paper I published and the first one where I summarized some generalizations that were not well known in the mathematics literature, and which I traced back to the work of Heinrich August Rothe in 1793. Not many people knew much about combinatorial identities in the 1940-50 times. I sent my solution of Problem 4211 to Chung and he suggested that I should publish it. He also sent me a more general research question that has had an impact on my own research work. This problem is related to

questions raised by eminent (late) Chinese mathematician Pao Lu Hsu (or Xu Bao-Lu/ 许宝禄) (1910-1970), whose work I admired also. Pao Lu was in Beijing and before L. C. Hsu wrote to me in 1965, I was not able to communicate with him. The problem offers still more avenues for further research even today. From time to time I would correspond with Kai Lai and admired his work. Just in recent years he asked me for a proof of an identity.

In 1965, seven years before U. S. President Nixon visited China to meet Chairman Mao, I began a collaboration with distinguished Chinese mathematician L. C. Hsu (Xu Li-Zhi/ 徐利治), then at Jilin University, Changchung, Peoples' Republic of China, who had written to me. We then published a joint paper in 1973 in the Duke Mathematical Journal that generalized many special combinatorial inversion theorems and that has sparked much further research. This was certainly one of the very first (if not the first) joint modern publications between USA and PRC mathematicians. Hsu is somewhat younger than Chung. However Hsu told me he had been a student of Chung many years before in China. Hsu visited me, staying at my home, and sent his daughter to study here, and invited me to be an associate editor of a journal he established at Dalian (Journal of Mathematical Research and Exposition/ Shu Xue Yan Jiu Yu Ping Lun / 数学研究与评论).

In the same way that I had not thought of publishing my very first paper in 1954, until Emil Grosswald and Leonard Carlitz urged me to do so, I am indebted to Kai Lai Chung for encouragement.

I studied Chinese writing as a youngster, memorizing several thousand characters, and then took regular classes in written and spoken Chinese circa 1988.

I have always felt it a great honor to work with Chinese mathematicians and assist with their work. Kai Lai Chung influenced my work and I feel the world of mathematics has suffered a great loss with his passing but we have been enriched so much because he lived and did mathematics and helped people.

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