

Ross Starr's remarks at the Tribute to Kenneth Arrow (Stanford October 9, 2017)

I'm Ross Starr, Professor of Economics at the University of California, San Diego. My professional life was decisively formed by my study with Ken Arrow.

I first met Ken, (then Prof. Arrow) in 1965, a lifetime ago. As an undergraduate at Stanford, I took Ken's graduate advanced mathematical economics course. It was far in advance of my training --- I had fulfilled few of the prerequisites, but Ken didn't say "No." He assigned me a daunting reading list as preparation. That course was a view into another world, where the precision of mathematics had a compass limited only by imagination. The focus of the course was Arrow-Debreu general equilibrium theory. It was presented in part from the working manuscript of Arrow and Hahn's *General Competitive Analysis*. The ink on some pages was still wet.

The course required a term paper. In those days before the internet, Ken had files with hard copy of all of the relevant working papers prior to publication, and he handed me a well chosen selection. I received detailed thoughtful comments on the paper in correspondence from Robert Aumann. Lloyd Shapley and his colleague John Folkman provided important new mathematical tools. The term paper became my first published work, "Quasi-equilibria in markets with nonconvex preferences," appearing in *Econometrica*.

From that beginning there was no turning back. In that Fall quarter, Ken permanently set the course for my career.

Ken described economics at Stanford in the 1960s:

"appears to be a golden age...Our group of faculty and students in economic theory at Serra House ... had an informality and collegiality ... We felt ourselves a community. Not an oppressed minority, but rather a vanguard. We were taking over!" On summer Fridays, wine and cheese parties at Serra House reinforced the esprit de corps. There was a bi-weekly joint Berkeley-Stanford mathematical economics seminar, meeting alternately at the two campuses. That was a lively setting including Arrow, Debreu, Kurz, McFadden, Radner, Uzawa, and visiting colleagues.

When Ken moved to Harvard, several of us followed: on the faculty were David Starrett and Masahiko Aoki, trailing graduate students were Louis Gevcrs, Walter P. Heller, and myself.

Ken spent summers at Stanford at the SITE seminar. It brought visitors from around the world. Those were vigorous intense multi-week sessions.

Ken was a great hero to all his students, so all of his attributes became legendary. We marveled at his presence in seminar. A colleague comments "Kenneth would regularly doze off ... he would wake up and -- remarkably -- make incredibly incisive comments. I sometimes wondered whether he could sleep, listen and process information all at the same time."

Ken has commented that he did not consider himself a great teacher. And there was a legendary failure: In the late 1960s Ken taught lower division principles of economics at Stanford. The TA's discovered that the lectures went way over the comprehension of the undergrads. The students were so bewildered that their exams were an embarrassment. The TAs said that they worked to keep Ken from finding out how badly the students had done. Eventually he discovered and was keenly disappointed.

And there were great successes.

At Harvard, Ken taught an amazing graduate course. The focus was the theory of social choice. The room was packed with graduate students and colleagues. The professors were the three greatest researchers in the field: the philosopher John Rawls (author of *A Theory of Justice*), Amartya Sen, and Kenneth Arrow.

In the 1980s, Ken taught a popular Stanford graduate course on the history of economic thought, offering the keenest of insights. The room was crowded with eager students and auditors.

Ken's success as a teacher includes successful students. Including four Nobel prize winners: John Harsanyi, Michael Spence, Eric Maskin, and Roger Myerson.

Despite his brilliance and achievements, Ken was totally unpretentious. Our colleague Richard Zeckhauser remarks:

“One of the most remarkable features of Kenneth, with colleagues, students and others, was that he did not recognize that he just knew more and saw more clearly than the rest of us. ... that he possessed not one sliver of excess pride or arrogance, was one of his most endearing qualities.”

Ken was so unassuming, that most of us do not realize that he was a leading football coach. The 'Little Big Game' is played annually by economics graduate student teams from Berkeley and Stanford. At the inaugural game, the teams had honorary coaches Gerard Debreu and Kenneth Arrow. The game trophy, known as the Arrow-Debreu core, is a brass Edgeworth Box, centering on an apple core.

There are celebrations: The 65th birthday in August 1986. An immense birthday conference and party took place at Stanford. It reunited colleagues and students from all over the world. There were two days of conference papers and testimonial remarks and a three-volume Festschrift.

70th birthday, the celebration was at the doctoral alma mater, Columbia, with another festschrift. Stanford's Arrow Lecture Series was initiated then, annually inviting leading researchers to Stanford.

A 40th anniversary party for general equilibrium theory was held in June 1993 at CORE in Belgium. Leaders of the celebration were the 20th century founders of the field, Kenneth Arrow, Gerard Debreu and Lionel McKenzie.

The 50th anniversary of *Social Choice and Individual Values* came in 2001 along with Ken's 80th birthday. The conclusion of that celebration sent the audience out singing into the evening. The ad hoc musical group, the Economy Singers, sang their advice to rising young economists: 'Brush Up Your Arrow, Start Quoting Him Now.'

So here we are again. 'Brush Up Your Arrow, Start Quoting Him Now.'