In Memoriam

F. BURTON JONES

1910 - 1999

Professor of Mathematics, Emeritus

F. Burton Jones who died on April 15, 1999, at the age of 88 had spent the later years of a distinguished mathematical career at UCR. He came here from the University of North Carolina in 1962 and became Professor Emeritus in 1978. Burton remained active in teaching and research at UCR for a number of years after his official retirement. In 1988 he and his wife Madeleine endowed the UCR Mathematics Department=s F. Burton Jones Chair in Topology, one of the first endowed chairs at UCR.

Burton made major contributions at UCR in research, teaching and service. He was one of the world=s leading researchers of his generation in the mathematical field of topology, specifically point-set topology. He was also well known for his contributions to the teaching of mathematics, being a leading practitioner of the "Moore method\textsuperscript{=} of teaching mathematics, which had an outstanding record of producing successful research mathematicians. Floyd Burton Jones was born in Cisco, Texas on November 22, 1910. That Cisco is situated in West Texas thereby making Burton a west Texan was a distinction that he savored. Burton received a bachelor\textsuperscript{=}s degree in chemistry from the University of Texas and then, according to his first doctoral student Louis McAuley, "When he entered graduate school at Texas, it was difficult for him to choose between mathematics and chemistry. At the time, there was a graduate assistantship in mathematics but none in chemistry. Perhaps, this fact influenced his choice. He fell under the strong influence of R. L. Moore, and mathematics became the dominant creative outlet for his life."

Moore had practiced a Socratic style of teaching so assiduously and so successfully that it became known as the Moore method. Burton wrote, "Moore would begin his graduate course in topology by carefully selecting the members of the class. If a student had already studied topology elsewhere or had read too much, he would exclude him (in some cases, he would run a separate class for such students). The idea was to have a class as homogeneously ignorant (topologically) as possible. He would caution the class not to read topology but simply to use their own ability. Plainly he wanted the competition to be as fair as possible, for competition was one of the driving forces. Moore would state some axioms, definitions and theorems in a class. In the next class he would call upon students in the reverse order of their success at proving theorems in class. When a student stated that he could prove a theorem he was asked to go to the blackboard and present his proof. The other students would make sure that the proof was correct and convincing. When a flaw in a proof appeared, everyone would patiently wait for the student at the board to patch it up. If he could not, he would sit down. Moore would ask the next student to try to prove the theorem. The program was about preparing students to do research in mathematics. That it was successful is attested to by the 1957 Albert Report which found that of the Ph.D.\textsuperscript{=}s produced in the United States and Canada from 1915 through 1954, the top 15% in productivity (according to its criteria) was composed of 5% from UC (Berkeley), 8% from Chicago, 16% from Harvard, 20% from Princeton and 25% from Texas. The debate over the years was over whether to teach students to learn mathematics or to prove theorems, to get the students to the frontiers of knowledge or to get them to develop skills. This was not a problem for much of Moore\textsuperscript{=}s career because in his prime he and his students were at
the frontier. It was a major problem for all who came after him. As theoretically-minded as he was, Burton was practical and down to earth. He modified Moore=s methods to keep them attuned to the changing times. Of his own teaching he wrote, "I have already mentioned that the instructor must possess patience, but I think that it is more than that. It must be patience that is born of the conviction that training a student to do research is important - even more important than conveying knowledge; that trying to develop a student=s mathematical ability to the limit of that ability is important. The instructor should suppress his urge to get into the act. Even an ugly proof from one of the students should please the instructor. Only on rare occasions (possibly "never is the better policy) should he show an elegant proof. Point-set topology is rife with complicated constructions and hard to state examples. Burton=s writing was spare and elegant; of his colleagues, he was always the surest and steadiest guide through thickets of complexity. His students learned that ugly proofs were a place to start, but spare, elegant proofs led to deeper insight.

His student Louis McAuley wrote, "There are times when I call to mind an image of Jones sitting in a classroom. He is sitting, perhaps in agony, as a student labors at the blackboard. He holds a pipe in one hand and scratches his head with the other. His brow is deeply furrowed. Those hazel eyes are fixed on the board. He is intensely interested in what the student is doing. Dr. Jones listens with the eager curiosity of a child hearing his first bedtime story. A smile crosses his face and his eyes light up with that wonderful joy of discovery when the student finally achieves success. It seems that almost each proof and each theorem is a new revelation to him. He is intensely interested in what others have to say - in what others are doing. This is indeed a rare talent. At other times, I can picture Dr. Jones standing before a class. He is deeply puzzled by some remarkable phenomenon (suggested, perhaps, by some student=s proof). With an amazing feigned ignorance (achieved only through years of experience), he motivates the discovery of a new concept or a new theorem."

Burton received his doctorate in 1935 and joined the faculty at the University of Texas. It was a time when academic positions might be divided in half ν two people would work full time for half the salary. Burton would speak of good mathematicians going back to work on the farm after they completed their doctorates. Mary Ellen Rudin, a prominent topologist who got her degree from the University of Texas in the late 40=s, writes about Burton=s early work, "Except for a few years on leave during World War II which Jones spent in Cambridge Massachusetts working on underwater sound, he spent the next fifteen years as a Professor at the University of Texas, sometimes as chairman of the department. He married [Madeleine] and his four children were born during these years. His interests in physics, chemistry, music, short wave radio and innovative teaching blossomed, and he made many friends. But also the varied mathematics of Jones has its roots in those days at Texas. In my mind Jones= mathematics divides into three (rather overlapping) areas1. Abstract set theoretic constructions. [For example,] in 1937 Jones made the normal Moore space conjectureΨ and this famous, fiercely difficult, very set theoretic conjecture kept many able mathematicians busy for almost fifty years, and its repercussions are still basic. 2. Simple beautiful facts. Jones had a special talent for coming up with the killing example to clarify some point. It has been a life long talent of Jones to find aesthetically satisfying insights. 3. Continua theory and homogeneity [For example] in 1941 Jones defined a local connectedness property called aposyndesis and used it effectively to classify continua. It has proved to be one of the most basic ideas in continua theory and has generated hundreds of research articles. Bur went to North Carolina in 1950 as chairman to help build up that department there, which he did very well. Before assuming his position at UCR he had spent a year at the Institute for Advanced Study in Princeton. There he extended his contact with the topology community enabling him to visit many mathematical centers in Europe, Australia, New Zealand, India and many other places. It enabled him to bring several well-known topologists, such as Borsuk, Kuratowski, Montgomery and Mary Ellen Rudin to visit UCR for extended
periods. Several other mathematicians visited for shorter periods because of his presence here. His scholarly contributions and distinguished leadership were the reasons for a four-day conference at UCR in 1980, participated in by many researchers from the United States and several from abroad. This was possibly the largest meeting of such a group on the UCR campus. Those who contributed for its proceedings included several of the leaders in their subject, such as Bing, Borsuk, Dugundji, Dyer, Effros, Rudin, Martin and many others.

At North Carolina Burton had directed five doctoral dissertations. He was in his prime as a thesis director when he came to UCR just when the graduate program in Mathematics was getting under way. He was to direct 10 doctoral dissertations at UCR Edward Thomas 1965, Lynn Gref 1966, Clifford Arnquist 1967, Eldon Vought 1967, James Rogers 1968, Edward Shirley 1969, Leland Rogers 1970, George Rudolph Gordh 1971, Don Fox 1973 and Barry Graham 1977. He also served as department chair and as a member of the Committee on Academic personnel. Over the years Burton had helped many topologists do their research and get their papers written. More than a few topologists had taken the "There is no such thing as a bad proof" philosophy literally. If they, or anyone else, were fortunate enough to get Burton as a referee for one of their papers then their work would likely end up looking well thought out, polished and elegant. Burton would work out what it was that they really had in mind and how it was that they truly intended to say it. It was also the way he dealt with his colleagues. He was always able to see good intentions behind their words and deeds and he was then able to assure them that they really had had those intentions.

Jones' mathematical interests are wider than point set topology. They included group theory, algebraic topology as well as complex analysis. His balanced view of mathematics was a great asset in developing the department here, as well as at the University of North Carolina, Chapel Hill. His advice was greatly respected and generally adopted here and elsewhere. He will be missed.

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