Clarence Francis Kelly

1906-1976

By Roy Bainer

The death of Clarence Francis Kelly, on May 5, 1976, following a prolonged illness, terminated a highly productive career in agricultural engineering of more than four decades. At the time of his passing, he was Professor Emeritus of Agricultural Engineering and Agricultural Engineer Emeritus in the Agricultural Experiment Station, University of California, Davis. During the final ten years of his career, he served as Director of the California Agricultural Experiment Station, Statewide.

"Kelly," as he was known to everyone (he disliked his given name), was born in Lawton, North Dakota, on October 18, 1906. He received the degrees of Bachelor of Science and Master of Science from North Dakota State College in 1931 and 1933, respectively. In 1964, his alma mater awarded him the honorary degree of Doctor of Science.

During the first three years, following graduation, he served his Alma Mater as Agricultural Engineer and Project Manager with the North Dakota Rural Rehabilitation Corporation, Bismarck.

In 1936 he joined the U.S. Department of Agriculture (USDA) to work on grain conditioning and storage problems in Washington, D.C. This work was transferred to Iowa State College, Ames, in 1941. The results of this investigation received international recognition. The work was suspended, however, for the duration of World War II, when Kelly served the U.S. Navy in antisubmarine warfare. Following the war he returned to Ames to continue the studies on grain conditioning.
A major change in his career occurred in 1946, when the USDA transferred him to the Davis campus of the University of California. His new responsibility was to initiate research, in cooperation with the Animal Science Department, on the effects of environment on the production of swine and beef cattle. He soon demonstrated the ability of working harmoniously with scientists in other disciplines.

Dr. Kelly and animal scientist Herbert Heitman, working on a study of swine conducted in the psychrometric chambers at Davis, obtained basic data on the metabolism of animals held under controlled environmental conditions. Differences of 300 percent were shown in food consumption for swine of the same weight, with temperature changes of only 30 percent (70°F versus 100°F). These results were crucial to the development of swine housing environment throughout the United States.

A field laboratory for studying the effect of heat stress on beef cattle was established at the Imperial Valley Experiment Station, where summer temperatures often reach 110°F to 120°F. Animal scientist Nicholas Ittner and USDA Agriculture Engineer T. E. Bond cooperated in these studies. Through modification of the environment in the feeding yards, they were able to show gains in weight exceeding two-and-one-half pounds per day (comparable with gains obtained in the Corn Belt). As a result, thousands of cattle are now fed under controlled environmental conditions in hot regions.

During the late 1950's, Dr. Kelly cooperated with Dr. Milton Smith of the Animal Physiology Department in the study of the behavior of chickens held in an environment where accelerating forces exceeded one G. This work was supported by grants from the Office of Naval Research, the National Aeronautics and Space Administration, and the National Science Foundation. Kelly designed and supervised the construction of huge centrifuges in which the chickens were studied. This study covered several generations of chickens. Whereas there were no final results, there were physiological changes in the birds. For example, a sixfold resistance to chronic acceleration (one- to three-G range) was obtained by several generation selections.
Dr. Kelly left the USDA and joined the agricultural engineering faculty of the University of California in 1950. In addition to continuing his research on animal environmental problems, he taught a senior-level course in farm structures and a freshman orientation course. He also directed graduate student thesis research. He became chairman of the department in 1961. In 1963, he was transferred to Berkeley to serve as Associate Director of the California Agricultural Experiment Station. He was made Director in 1965, a position that he held until retirement. In this position, he was responsible for coordinating agricultural research on four campuses of the university and at ten agricultural field stations. Dr. Kelly retired from the University in 1973 and devoted a year to administration service with the USDA in Washington, D.C.

In 1958 Kelly was elected a Fellow in the American Society of Agricultural Engineers (ASAE). He was chosen the first correspondent representative of ASAE in the International Society of Agricultural Engineers in 1959. He served as Vice-President and on the Board of Directors of ASAE in 1960-63 and President in 1972-73. During the annual meeting of the Society in Lexington, the Governor made him a Kentucky colonel.

In recognition of his exceptional and meritorious achievement in agricultural engineering, Dr. Kelly was awarded the Cyrus Hall McCormick Gold Medal by ASAE in 1963. In 1968 he was the second agricultural engineer elected to the National Academy of Engineering. His contribution to the Academy included serving on the Committee on Agricultural Production Efficiency and the Committee on Membership-General Engineering Peer Group.

Dr. Kelly's bibliography lists some 140 papers. He received national recognition for four of them. He was a recognized pioneer for his contributions related to livestock production with emphasis on thermal stress and environmental modification for improved efficiency in production. He had a pleasing personality and was a close friend to all that knew him. He had a subtle sense of humor that was enjoyed by all.

Clarence Kelly is survived by his wife, Elizabeth, a son, Robert, and a brother, Laddie, in all of whom he took a great pride.