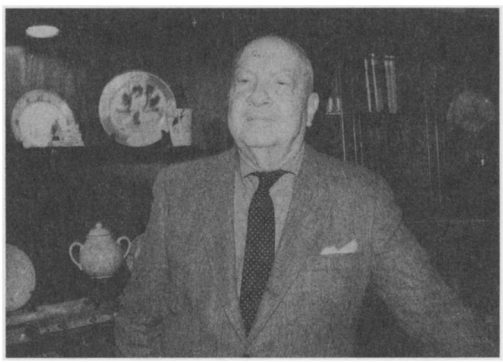
# THOMAS PARK
## 1908–1992

Thomas Park died of cancer on 30 March 1992. He is survived by his wife of 23 years, Frances Lear Park. His surviving daughters, Judith Barnett of Chicago and Sherley Hohmann of Fort Pierce, Florida, were born to his first wife, Martha Whitehead Park, who died in 1963. He is survived by 6 grandchildren and 10 great-grandchildren.

Thomas Park was Professor of Zoology, later Biology, at The University of Chicago (Emeritus 1974), a principal architect of experimental population ecology, a devoted teacher of graduate students, author and editor, and a servant and spokesman for ecology and the environmental sciences.

Thomas Park was born in Danville, Illinois, the younger of two sons of Samuel Thomas and Sophronia (Stealey) Park. The family resided for some time in Ocean Springs, Mississippi before settling in Chicago, where Thomas completed high school. Something about the Park family life must have fostered an enduring interest in science and natural history, for both boys—Orlando, some 8 years older, and Thomas—enrolled in Zoology at the University of Chicago and went on to become ecologists and prominent Professors of



Zoology (Orlando at Northwestern University). Thomas received his Ph.D. in 1932, 3 years after his brother. His thesis was conducted under the direction of W. C. Allee and was a demographic study that marked the beginning of his association with the flour beetles, genus *Tribolium*.

The early years of the Great Depression were hard times for young Ph.D.'s and Park was one of the fortunate few to find a postdoctoral position in his profession. His National Research Council Fellowship provided just enough support for himself, his young wife, and their first daughter. It also

provided the extraordinary opportunity to work at Johns Hopkins University with Raymond Pearl. Pearl must certainly have been a formative influence on Park, for there would seem to have been no other source among ecologists at that time for his statistical and demographic approach. While embracing quantitative methodologies that served him in his empirical studies, Park just the same exhibited the independence of mind not to become a devotee of logistic theory. This must have required a great deal of resistance, for Pearl, a co-discoverer of the logistic equation, championed it fervently as "a law of nature."

After his fellowship Park spent a short term as a junior faculty member at Johns Hopkins. He was then invited to return as an Instructor to The University of Chicago. This meant the renewal of his association with a distinguished faculty including Sewall Wright, whom he regarded as "the great zoologist of the twentieth century." He admired Wright's experimental work even more than his spectacular theoretical contributions. Wright's leadership in quantitative and statistical biology must have been an inspiration to Park, who in turn was developing an experimental approach to population ecology.

A great deal of Park's influence as an ecologist came about not because he developed a position of advocacy, but rather, because his laboratory studies served as a model to other experimentalists—particularly to those ecologists who would undertake field experimentation. For this reason I count the development of "The *Tribolium* Model" (Neyman, Park, and Scott 1956) as his foremost scientific contribution.

The *Tribolium* model is a laboratory system, experimental and statistical, for studying the population biology of flour beetles. The main interest in the Tribolium model is its importance as an empirical and conceptual construct in ecology. It was first exploited for ecological work in the 1920s by the University of Minnesota ecologist R. N. Chapman, but it was perfected by Park and his associates. It is a simplified system, superbly accessible and suited to experimental manipulation, but of immense and perplexing ecological and demographic complexity. Using this construct Park has shown that well-designed and adequately replicated experiments, usually simple in their conception, have a great potential for unraveling the intricacies of complex systems—particularly so when the studies make use of probabilistic models that are tailored for the purpose of experimental design. This would seem to be a contribution not just to ecology but to the systems sciences as well.

Today the *Tribolium* model stands as one of the best understood ecological systems and one that has foretold many ecological phenomena that were later confirmed in nature. It stands ready to attack new problems that might be considered beyond experimental resolution to ecologists working out-of-doors.

There is not space to describe the frustrations and painstaking work that went into the perfection of the *Tribolium* model, although such an account would make desirable reading for workers trying to develop similar ecological systems on their own. Here one episode should suffice. Much of the early flour beetle work, Park's included, was plagued with infectious diseases caused by protozoans of the class Sporozoa. The most devastating of these was *Adelina tribolii*. The diseases were unknown to ecologists and struck sporadically, sometimes destroying experiments that had been in progress for years. Park, assisted by microbiologists at The University of Chicago, learned over a period of some 5 years how to diagnose and control these pathogens. While doing this, by doubling the size of an already mammoth experiment, Park (1948) was able to describe the impact of *A. tribolii* on the outcome of interspecies competition between *Tribolium confusum* and *T. castaneum*. He found that the presence of disease could completely reverse the identity of the winning species, and he documented demographic pathways underlying this reversal.

The best known contribution to come from the *Tribolium* model is Park's climate experiment (1954), one of a series of interspecies competition studies using the species *T. confusum* and *T. castaneum*. In most climates single-species populations persisted indefinitely through time, but the species never coexisted when husbanded together. Instead, depending upon climate, one or the other exterminated its rival and reverted to a self-regulating single-species system. Quite often, Park observed competitive indeterminacy: in populations that were perfect replicates in terms of every experimental variable subject to control, chance events evidently determined which species was the winner. This phenomenon is usually identified with demographic stochasticity, and evidence supports this (Mertz, Cawthon and Park 1976). Aside from their ecological realism, a great deal of the admiration for Park's experiments derives from his adherence to simple Fisherian experimental design and for providing enough replication for statistical purposes and, beyond that, enough to detect un-

common occurrences. The ecological significance of this work is that it contributes to an understanding of how competitive processes affect the ecological diversity of species over a range of environmental conditions.

Park's long-term census histories and the phenomenon of competitive indeterminacy attracted the attention of many probabilists. David G. Kendall and M. S. Bartlett published on the flour beetles, and Jerzy Neyman and Elizabeth Scott went into collaboration with Park (Neyman, Park, and Scott 1956). P. H. Leslie renewed collaboration begun when Park worked in England with Charles Elton (Park, Leslie and Mertz 1964; Leslie, Park and Mertz 1968). These early efforts with stochastic models sometimes served as useful predictive devices and were instrumental in developing probabilistic reasoning and notions of stochasticity in ecology.

Throughout his later career Park was active as an editor. He served on the Editorial Boards of *Acta Biotheoretica*, *The Quarterly Review of Biology*, and *Encyclopaedia Brittanica*. From 1940 to 1950 he was Editor of *Ecology*. Then he resigned and became editor of *Physiological Zoology* for The University of Chicago Press (1952–1974). In this position he had more control over editorial policy, and he liked not being subservient to the interests of a professional scientific society. However, he did enjoy editing *Ecology*, and one of his favorite reminiscences was that of publishing Raymond Lindeman's "The Trophic–Dynamic Aspect of Ecology" (1942) against the advice of America's two foremost limnologists. In the authoritarian academic climate of the 1940s, this was a courageous decision for a young editor.

One of the most monumental accomplishments of the Chicago area ecologists was the publication of *Principles of Animal Ecology* (Allee, Emerson, Park, Park, and Schmidt 1947). Besides Park the authors were W. C. Allee, Alfred Emerson, the termitologist and evolutionist, Park's brother, Orlando Park, and Karl P. Schmidt, Curator of Zoology at The Field Museum. The book became known as "The Apes," or "The Great Apes" for the contrived reason that, with a different order of authorship, this would have been an approximate acronym. "The Apes" was no textbook, but rather, a creative and critical synthesis of all animal ecology to date, something that no one has the temerity to attempt today. The authors had differences, but somehow these were reconciled, and each man took the responsibility for his own chapters, the text was unified, and the book emerged as intended: the foremost scholarly treatise in its field. Today it is particularly remembered for Park's chapters, which served as an introduction for many to the population point of view.

From 1943 to 1947 Park was Associate Dean of Biological Sciences, and, although his contributions were admired, he discovered that administrative duties were not to his taste. However, he distinguished between professional service and administration and accepted commitments that served to advance the cause of ecology. In 1959 he was President of The Ecological Society of America. In 1961 he was President of The American Association for the Advancement of Science. One of his favorite service activities was his membership on the Illinois Board of Natural Resources and Conservation from the 1950's into the 1970's. The Board's efforts included lobbying legislators and governors and helping to maintain the Illinois Natural History Survey and the Illinois Geological Survey—model state agencies with a significant research commitment.

Park regarded his association with graduate and postdoctoral students as his most gratifying commitment. The *Tribolium* model provided many of them with a valuable scientific apprenticeship, which Park further enriched by involving them in scientific conferences, editorial activities, student teaching, and a rough-and-ready mix of ecological and environmental projects. Then each one was encouraged to mold an original research conception. Their theses were never assigned. Aside from being unusually intelligent and hard-working, these students were a disparate lot. Many of them were amazingly impecunious and vulnerable to personal and family problems that might have proved minor in a less demanding and more prosperous environment. A few of them were also hearty participants in the varied ethnic pleasures and boisterous atmosphere of Chicago's South Side. Understandably, Park had ample opportunity to provide them all manner of personal help as well as scientific and professional guidance. He obviously relished this, and his good humor always prevailed. He became a master at helping students to develop original research that was rigorous but did not bear the stamp of any identifiable school of ecology. All of his Ph.D. students, save one, were successful degree candidates.

Park received his share of honors and distinctions, including the ESA's Eminent Ecologist Citation in 1971 and an Honorary Doctor of Science from the University of Illinois at Urbana-Champaign in 1973. However, his most remarkable distinc-

tion is in having named his own field. He taught a course entitled "Population Ecology" to graduate students at The University of Chicago in the 1940s and introduced this term into the literature in an *Ecological Monograph* (1946).

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David B. Mertz
Department of Biological Sciences
University of Illinois at Chicago
Box 4348
Chicago, IL



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