

Gordon Edwin Dickerson, 1912–2000: A brief biography¹

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Gordon Edwin Dickerson, an early leader in the use of principles of quantitative animal genetics for livestock improvement was born in Lagrande, Oregon on January 30, 1912. The first son in a family of eight children, Gordon moved with his parents back to Bloomingdale, Michigan in 1915. As he stated, he loved growing up on their farm. In eighth grade, he met Myra Warren (a ninth grader who was 14 d older). Those high school sweethearts were married just after Gordon's graduation in 1933 from Michigan State College. They were truly partners for the next 67 yr. Three of their four sons were born in Madison, Wisconsin, where Gordon did graduate study in animal genetics with L. J. Cole

and where he also served as an instructor in dairy science. The fourth son was born in Ames, Iowa.

Gordon's academic ability, creativity, and attention to detail were apparent in East Lansing, where he graduated cum laude with a double major in dairy husbandry and chemistry. His "senior" thesis, which involved fat secretion in the udder of dairy cows, was the first written work that exhibited Gordon's life-long principle of obtaining the most possible information from each experiment or set of data.

Gordon's Ph.D. thesis (1937) at Wisconsin, which was an early analysis of Dairy Herd Improvement Association (DHIA) data with what would now be considered primitive computing equipment, showed the same thoroughness and attention to detail. There he also began a lifelong professional and close personal friendship with A. B. Chapman. As a Cole student, he worked through the early papers of Jay Lush and Sewall Wright and thoroughly absorbed the methods of path coefficient analysis, which he applied throughout his professional career of more than 50 yr. His work in the dairy department was primarily with DHIA data, which became the basis for the national dairy sire summary.

In 1947, "Gord"—as he was known to Myra ("Dick" by many of his peers)—and his wife moved to Ames, where Gordon (as most of us later knew him) began his first tour as a research geneticist with the USDA at the Regional Swine Breeding Laboratory directed by W. A. Craft, an earlier Ph.D. with Cole. In Ames during that period were many of the leaders in "modern" animal breeding, including Jay Lush, Lanoy Hazel, Charles Henderson, and as a visitor, Alan Robertson, among many others who have distinguished themselves. Gordon was certainly a member of that "elite" group, although he would never have admitted or thought that. Somewhat surprisingly, Henderson, Hazel, and Dickerson were born within a 10-mo period spanning April 1, 1911 (Henderson) to January 30, 1912.

At the swine lab, some of Gordon's most remarkable papers were published. One paper described techniques that are still used today to analyze designs for testing inbred lines. A most important paper with Hazel established the basic formulas for predicting genetic progress from selection, taking into proper account accuracy of selection, intensity of selection, and generation interval for both males and females (with dairy cattle, the formula is expanded to four selection paths).

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Gordon's path and his positive and stimulating influence on the paths of many colleagues led him to the University of Missouri in 1947, where, within a short time, he went from associate to full professor. In a 5-yr span, he established a remarkable record of mentoring graduate students (eight Ph.D. and three M.S.) and the features of his benevolent but demanding leadership first became apparent (at least to his graduate students, who included Hauser, Squires, Gregory, Krueger, Warren, Arthaud, Gyles, Dillard, and Neville). The range of his students' research also illustrated Gordon's wide interests, including use of experimental animals. His Missouri students did research primarily with poultry, swine, and mice, although their careers were generally with beef cattle or poultry. Keith Gregory, who later became Gordon's director during his last tour as a USDA scientist, was the first Ph.D. student who started and finished with Gordon.

The Heterosis Conference held in 1950 in Ames featured the most important animal breeders of that time. Gordon's paper, *Inbred Lines for Heterosis Tests*, continued a theme that would reappear throughout his career. "Why are rates of genetic improvement less than expected?" The inbreeding—heterosis interplay was one of those bases.

Another classic paper from that period (published in 1954 after Gordon's path had once again moved on, but which was written at Columbia) was NCR Publication No. 38, entitled *Evaluation of Selection in Development of Inbred Lines of Swine*. Gordon was lead author with Blunn, Chapman, Kottman, Krider, Warwick, and Whatley. The paper summarized some 43 experiments from the north-central region. A lasting and most powerful tool for animal breeders was developed in a line or two of that bulletin: the index in retrospect, which can be described as "What multiple trait index would have given the responses observed?" The index in retrospect provides a picture of how selection was actually practiced, rather than of what was intended. For example, the intended index at the NCR stations was as follows:

$$I = D + 0.50 \times W$$

where D refers to dam productivity and W to 154-d weight. The index, in retrospect, averaged over all experiments, was as follows:

$$I = D + 1.10 \times W + 1.56 \times C \text{ for boars}$$

$$I = D + 0.88 \times W + 8.73 \times C \text{ for gilts}$$

where C represents a conformation score. What was actually practiced was quite different from what was intended—a powerful tool.

Marvel Baker, a colleague in the NCR project, asked *Quo vadis?* of Gordon and Myra as they were preparing for a major move to the commercial poultry world of Kimber Farms (1952–1965). Kimber Farms in Nyles, California, had been a family business since the 1930s.

Both Lush and Hazel had collaborated with the geneticists there for several years. Gordon began as a geneticist and later was director of research and a member of the board of directors of Kimber Farms.

Despite continuing with a busy professional career, Gordon contributed much time, wisdom, and foresight to his new community of Fremont, California. Gordon and Myra's four sons all graduated from Washington United High School. Gordon was a trustee of the school board for two 4-yr terms and was president of the board during an expansion from two to five high schools. He was also a member of the Fremont Planning Commission (8 yr) shortly after incorporation of Fremont. As president and director, he led the Community Chest appeal. Gordon served as elder and church school superintendent (7 yr) at Centerville Presbyterian Church. He also worked with the Boy Scouts (12 yr) and was president of the PTA.

Gordon did not vanish from his profession during this period. His publication record during this period averaged over three papers per year. Many of those were invited presentations to be published in proceedings. These invitations averaged about one per year and, by their variety, illustrate Gordon's breadth of knowledge and insight. The presentations included a Cold Spring Harbor symposium on Quantitative Biology; a AAAS Symposium on Germ Plasm Resources; a NAS-NRC symposium on Statistical Genetics and Plant Breeding; a symposium at the World's Poultry Congress in Sydney, Australia; a symposium in England in honor of Sir John Hammond; the Macy Foundation Conference of Genetics; a symposium on the application of new statistical methods sponsored jointly by the Biometrics and Genetics Societies; and a symposium paper for the Poultry Science Association on *Breeding for Leucosis Resistance*.

A monumental gift to his profession during this period was his contribution on *Techniques for Research in Quantitative Animal Genetics* to the 1959 ASAP monograph on Techniques and Procedures in Animal Production Research. He later extensively revised that contribution for the second (1969) edition of the ASAS Monograph on Techniques and Procedures in Animal Science Research.

For a short period (1965 to 1967), he was with Bob Gowe in Ottawa with the Canadian Department of Agriculture working with quantitative genetics of egg poultry. While there, he became a lifelong friend, mentor, and colleague of a young worker (Alan Emsley), who became his first Ph.D. student a little later at the University of Nebraska. His commitment to Bob Gowe completed, Gordon and Myra made their final move in 1967 to a unique position marking a return both to USDA (Roman L. Hruska U.S. Meat Animal Research Center) and academia (University of Nebraska at Lincoln).

Gordon's primary position (at U.S. Meat Animal Research Center under his former student, Keith Gregory) was to lead research in swine and sheep breeding and to coordinate work of graduate students in Lincoln.

Naturally, Gordon became involved with much more. He was actively involved with design of the Germ Plasm Evaluation and Germ Plasm Utilization Programs for beef cattle and sheep; the composite breed experiments with cattle, sheep, and swine; the beef cattle twinning experiment, the Hereford selection experiment; and many swine and sheep experiments. His main focus was on net lifecycle biological efficiency (i.e., the whole system). He also focused on definition and estimation of direct and maternal breed effects, heterosis, and recombination effects in breed evaluation and utilization experiments (e.g., his paper, *Inbreeding and Heterosis in Animals*, in Proceedings of the Animal Breeding and Genetics Symposium in Honor of Dr. J. L. Lush, 1972). His efforts covered sheep, swine, and beef cattle and also involved a major effort with the rat as an experimental animal as well as computer simulations.

Gordon made a lasting impression on all he met and, in particular, his graduate students. His teaching style was unique and did not end in the classroom. His formal and informal seminars (with noon and late-Friday afternoon schedules) were legendary. No one who participated ever regretted the opportunities. A quote from a University of Nebraska at Lincoln student, Dave Notter, illustrates his approach:

Gordon has a unique ability to hold complex ideas and systems in his mind; he can turn them over, view them from all sides with a critical eye and identify the essential components of difficult problems. As one works with him, one soon develops the philosophy that this is what science is really all about: a no-stone-left-unturned attack on the unknown or the unclear. He prepares his students to give their best. He demands it by example.

A similar view came from an earlier student at Missouri, Roy Gyles:

Dickerson taught by association, by example, by challenge. He was first at work and last to leave. No coffee break or football small talk attracted him. Steady at his desk all day with intermittent breaks to teach class. His lectures portrayed his personality. Nothing was taken for granted but questioned, viewed from one angle, then the next and pressed further as if to get a second milking. Self-pity grasped me with lack of the basics. There was no exit, only onward march.

If Gordon had a weakness, it was the mass of material he managed to include on an overhead or a slide for a class or even for a major presentation. Much of such material was an attempt to summarize biological components of efficiency of livestock production. These slides and graphs would present as much of the whole picture as was possible. The graphs were a way for Gordon to conceptualize all aspects of a livestock production system. The detail, however, may have seemed overwhelming to those not so well versed.

Although all students at University of Nebraska at Lincoln during this period could claim to be one of Gordon's, the official list included Emsley, Gosey, Olson, Notter, Fogarty, Tess, Wang, Rios-Ramirez, Buckley, Olthoff, Setshwaelo, Mohd-Yusuff, and Green as Ph.D. students and Sherrill, Nunez-Dominguez, Guerra, and Gama as M.S. students. Visitors and post-doctorate students who had the unique opportunity to be with Gordon were Künzi, Smith, Van Vleck, Lindhe, Bennett, Kashyap, Baker, Kress, Wang, Azzam, and Keele. Some of his fellow faculty and younger colleagues at Lincoln and Clay Center also considered themselves to be among his students: Ahlschwede, Cunningham, Gosey, Johnson, Keown, Koch, Long, Nielsen, Cundiff, Gregory, Leymaster, Van Vleck, and Young.

A lasting contribution to his profession was Gordon's somewhat brash decision to ask that Lincoln, Nebraska, be the host to the Third World Congress on Genetics Applied to Livestock Production (1986). The massive effort of Gordon and his colleagues at University of Nebraska at Lincoln and U.S. Meat Animal Research Center made this a truly World Congress that has subsequently met every 4 yr in the leading centers of animal breeding research and teaching: Edinburgh, Scotland; Guelph, Canada; Armidale, Australia, and Montpellier, France. The 7-d event in Lincoln included more than 600 participants, 55 sessions, four volumes of proceedings, and tours of U.S. Meat Animal Research Center and the sandhills of Nebraska.

From the outset of this brief biography, the theme has been Gordon's path. The official duty stations provide just a skeleton of that path. His influence came in many forms. The list of countries visited by Gordon and Myra (Myra has said she accompanied Gordon on all except two) where he made presentations numbers 24, with an additional 13 that he visited while on business with Kimber Farms.

Probably more animal breeders have been a guest in the Everett Street home of Gordon and Myra than in any other in the world. Most visitors to Lincoln would experience the hospitality and generosity of the Dickersons—some for an evening and others for longer periods in their basement apartment. Those gatherings of the world of animal breeding continued long after Gordon's official retirement in 1987. Several times each year they would host "potluck" dinners for all students and visitors in residence in Lincoln, especially at the time of the Thanksgiving holiday in late November when all who remained in Lincoln were invited to share their foods and customs with others. Many, many students, visitors, and their families have fond memories of those gatherings with Gordon and Myra. Gordon and Myra were products of the "Depression years" of the 1930s and were, in their own words, "frugal." They were also, however, exceedingly generous with their time and hospitality.

After official retirement at age 75, Gordon continued both with his professional interests and with his commitment to improve his community and the world. Pa-

pers of his last students were completed. He continued to serve on graduate student committees and was a regular at weekly graduate seminars and journal club discussions. His last scientific paper (1995) came 61 yr after his M.S. thesis and was a chapter on the “Economic Importance of Prolificacy in Sheep.” Until the late 1990s, he was also the unofficial captain of the departmental bowling team—the last trophy was dedicated to Gordon.

Although modest and humble, Gordon received many honors. He was a fellow of AAAS and ASAS. His awards included the highest of many organizations: the 1990 International Award from Gamma Sigma Delta, the F. B. Morrison Award (1978) from ASAS, the Pioneer Award (1982) from BIF, the Continuing Service Award (1989) from NSIF, and the Science Hall of Fame Award (1990) from USDA. The 1990 group of five included Gordon, a Nobel Prize winner, and the leading wheat and corn breeders in the United States, as well as a fellow poultry scientist who had been administrator of ARS.

Gordon was an active member of 11 scientific associations and four honorary societies. His personal frugality did not extend to his professional commitments or to his commitment to the local and worldwide communities. In Lincoln, his community activities continued. He was a leader in the Capitol City Chapter of Kiwanis International, a member of the Mayor’s Committee for International Friendship, and an officer and program chair for the Lincoln Chapter of the United Nations Association.

Early in August 2000, Gordon and Myra attended the annual Dickerson reunion near Bloomingdale, Michigan. Shortly after their return, Gordon’s physical journey ended on August 27 in Lincoln, at the age of 88.

The preceding has highlighted professional contributions and highlights but not much of the personality and character, which, together with his scientific ability and achievements, combined to make the life of Gordon

Dickerson a model for his friends and colleagues. A sampling of letters to Myra after Gordon’s death or in support of his nomination for a national award may give a glimpse of how unique Gordon was.

“Truly, there have been few who have made such important contributions to genetics and animal breeding over so many years.”

“Gordon really loved all mankind, for he is devoid of any prejudice of race, color, or religion.”

“I often admired the elegant and unique way in which he would formulate his thoughts. He was an honest man with a fine sense of humor. I am ever so grateful he crossed my path.”

“I certainly wanted to write on Dr. Dickerson’s behalf because he had such a positive impact on my life. I worship the man!”

“I wondered what sort of man this was that had parted the clouds for me and let in the sunshine.”

“You said that you thought that ‘I had married just plain Joe!’ You certainly do have to change your mind, for in truth, you married a fellow who was rather close to a god to many, many people in the Animal Breeding Fraternity!! I have never heard anything but the most sincere praise for Gordon!! You certainly married one of ‘the Greats,’ and so did he!”

This last note from a student who had Gordon as a member of his committee 30 yr earlier may sum up many of the feelings and respect of Gordon’s worldwide friends, neighbors, and colleagues.

“He has been my model to imitate, unfortunately without success. For me, it is an honor to have had an advisor with such human and scientific attributes. It was good luck for me to have had the opportunity to meet him.”