George Waddel SNEDECOR
b. 20 October 1881 - d. 15 February 1974

Summary. George Snedecor is widely known for his text *Statistical Methods*, first published in 1937, now in its eighth edition. He was the founder of the Iowa State University Statistical Laboratory in 1933, the first unit if its kind in the United States.

George W. Snedecor is best remembered as a pioneer in making statistical tools accessible to experimenters in agriculture, biology, and other areas of application. Through his work he laid the foundations for what is today the Department of Statistics at Iowa State University, one of the most prestigious of applied statistics departments.

But perhaps his most remarkable contribution was his book, *Statistical Methods Applied to Experiments in Agriculture and Biology*, published first in 1937, and arguably the most popular and influential statistics text ever written.

1. Origins

George Waddel Snedecor was born in Memphis, Tennessee, the oldest child of James George Snedecor and Emily Alston Estes. George's father was the descendant of Dutch pioneers who had arrived in the United States in the early part of the 17th century. At the time of George's birth, James Snedecor was a practicing lawyer in Memphis. Soon after George was born, the family moved to Florida and later to Alabama, where his father, by then an ordained Presbyterian minister, preached in churches in and around Birmingham.

Most of young Snedecor's school years were spent in Alabama. In 1899, he began two years of college at the Alabama Polytechnic Institute in Auburn, followed by two years of preparatory school teaching. When the family moved to Tuscaloosa in 1903, George transfered to the University of Alabama. In 1905 he graduated with a B.S. in mathematics and physics, with honors. After graduation, George accepted his first academic job, at the Selma Military Academy. As an instructor he taught at the Academy from 1905 through 1907. He then secured a position in Sherman, Texas, teaching mathematics and Greek at Austin College. It was in Sherman where he met and married Gertrude Douglas Crosier in 1908, the daughter of a dormitory matron at Austin College.

In 1910, the Snedecors moved to Ann Arbor, Michigan, while George furthered his education at the University of Michigan. In 1913 he received an A.M. degree with a major in physics.

Finally in 1913, George and Gertrude arrived in Ames, Iowa where they remained until 1958. Both sons, Edward Crosier and James George, were born and raised in Ames. It was there where Snedecor made his mark in the world of statistics.

2. The Early Iowa State College Years

George W. Snedecor joined the faculty at Iowa State College as an Assistant Professor of Mathematics in 1913. He was quickly promoted to Associate Professor, and in 1915 taught a course entitled "Mathematical Theory of Statistics". This was the first statistics course designed to formally introduce statistical methods to researchers in the mathematical and other sciences. The name of the course soon changed to "Statistical Methods of Interpreting Experimental Data", and a second course entitled "Biometric Methods of Interpreting Agricultural Data" was introduced.

By the early 1920s, with several departments across campus offering courses in statistics, researchers in many areas of application were using techniques such as regression analyses on their data. The Graduate College was created in 1920, with the mission of promoting research, particularly in areas of importance to agriculture. Snedecor, with his interest in interdisciplinary research, is likely to have been influential on researchers such as Lindstrom, who by 1925 was using multiple regression models, quite a sophistication for those days (Cox and Homeyer, 1975; Melde, 1990; David, 1998).

In 1927, the Mathematics Statistical Service was established, with Snedecor and A. E. Brandt at the helm. The Service was created to formalize statistical consulting activities, and was the precursor of the Statistical Laboratory, established in 1933. Gertrude Cox (q.v.), who worked part-time in the Mathematics Statistical Service, was the first student to graduate with an M.S. degree in statistics, awarded by the Department of Mathematics in 1931.

By the late 1920s Snedecor was recognized as a preeminent statistician, and in 1931 was promoted to Professor in the Department of Mathematics at Iowa State College. During this time, Snedecor developed an important relationship with R. A. Fisher (q.v.) who was producing path-breaking research at Rothamsted Experimental Station. Their correspondence resulted in two influential six-week visits by Fisher to Iowa State College, in the summers of 1931 and 1936. See also Section 4.

3. The Statistical Laboratory Years, 1933-1947

In recognition of the importance of statistics in other fields of inquiry, Iowa State College established the Statistical Laboratory in 1933, with Snedecor as its Director. For perhaps the first time in the United States, experimental statistics was officially recognized as a science different from mathematics.

Under Snedecor's direction, the Statistical Laboratory became an active center for the research and teaching of statistics. Many visitors were attracted and the permanent staff was substantially increased as a result of a cooperative agreement in 1938 with the U.S. Department of Agriculture. W. G. Cochran was hired at this time and played a key role in strengthening work in survey sampling and in launching a PhD program in statistics (Cox and Homeyer, 1975).

The 1930s were Snedecor's most active research years. He also carried out the administrative duties as the Director of the Statistical Laboratory, in spite of a profound dislike for paperwork. Indeed, it was his reluctance to take on any additional administrative duties that may have led him to resist the creation of a Department of Statistics in the 1930s. As it was, Gertrude Cox went on to establish the Department of Experimental Statistics at North Carolina State College in 1941, the first in the nation. The Iowa State College Department of Statistics was created in 1947.

4. Publications

In 1924 Henry A. Wallace, then editor of *Wallaces' Farmer* and later Secretary of Agriculture and Vice President of the United States, gave a series of ten Saturday afternoon seminars at Iowa State College. He was anxious to pass on to an audience of mainly agricultural and biological research workers the expertise in multiple regression that he had gained primarily in studying the factors influencing corn yields (David, 1998). Wallace summarized these lectures in a bulletin *Correlation and Machine Calculation* that was put in final shape by Snedecor, one of his listeners. This booklet of just 47 pages (Wallace and Snedecor, 1925) reached worldwide circulation and was Snedecor's first publication, at the age of 42.

Soon thereafter Snedecor became aware of R. A. Fisher's fundamental contributions and was among the first in the United States to recognize their great practical importance. This resulted in a major revision of the bulletin (Wallace and Snedecor, 1931), in a small book in which the F-statistic is introduced (Snedecor, 1934, p. 15) and, most important by far, in *Statistical Methods* (Snedecor, 1937).

Statistical Methods was a phenomenal success, and has gone through eight editions. Snedecor was sole author of the first five, the last three being co-authored by W. G. Cochran. The eighth edition was prepared in 1989 by several members of the Iowa State Statistics Department. Long after the death of the co-authors, the text still had nearly 2000 entries in the Science Citation Index for 1995. Total sales of the editions in English (apart from those published in India) have reached 237,000.

The first edition already makes it plain why this book was to prove so successful. Snedecor had a gift for writing simply and clearly, often using a conversational style. The need for the statistical approach is presented enthusiastically through a series of examples likely to be close to the reader's heart. Snedecor constantly asked questions. There were many tables and charts. The book was studded with helpful and varied exercises. Readers rusty on even elementary mathematics were not ignored. Each topic was introduced unhurriedly and treated in considerable detail, yet a surprising amount of material was covered. Many of the references listed reflected Snedecor's wide experience gained as a consultant to research workers.

In addition, Snedecor filled a real need to satisfy the burgeoning interest of biological research workers in useful statistical methods. The basic texts, Fisher's *Statistical Methods for Research Workers*, first published in 1925, and followed by *The Design of Experiments* in 1935, were impressive and written in a masterfully spare English style. But research workers found them very difficult. It is interesting to note that in the course of a warm correspondence with Fisher, Snedecor writes in 1936 that he is working on an elementary text "designed to lead the beginner to an appreciation of your books." This aim Snedecor accomplished splendidly, even if his presentation was not without occasional shortcomings.

Snedecor's journal articles are mostly in the same spirit of dealing in as simple a way as possible with problems of direct interest to the experimenter. Many of these papers are joint with experimenters or statisticians at Iowa State, on topics including experimental design, analysis of variance and covariance, the chi-square test, disproportionate subclass numbers in multiple classifications, and sampling. Snedecor wrote also on his own on the last two topics, as well as on computing and statistical education and philosophy. The wide knowledge he had gained helping research workers qualified him admirably to be the first editor for Queries in *Biometrics*, from 1945 to 1958. If the flow of queries from readers was slow, he could draw on his vast consulting experience to manufacture a query!

5. The Department of Statistics Years, 1947-1958

In 1947 George Snedecor stepped down as Director of the Statistical Laboratory. He remained as Professor of Statistics until his retirement from Iowa State College in 1958.

By the 1940s, Snedecor was recognized throughout the world as an authority in the development of statistical methods. He was an active member of the American Statistical Association (ASA)and the Biometric Society. He served as Vice President of ASA in 1947, and as President in 1948. In 1950 he was elected member of the International Statistical Institute, the 28th from the United States (Cox and Homeyer, 1975). The Royal Statistical Society made him an Honorary Fellow in 1954.

In 1958, Snedecor retired from Iowa State College after 45 years of service. He was responsible for the establishment and flourishing of perhaps the most influential group of applied statisticians in the United States in the first half of the century and his legacy lasts to this day. The Department of Statistics at Iowa State University is now housed in Snedecor Hall, a fitting tribute to the man.

After retirement in San Diego, California, Snedecor retained a lively interest in Statistics until late in life. He was further honored by the award of the Samuel S. Wilks Memorial Medal in 1970, by election as an Honorary Life Member of the Biometric Society in 1971, by a book of papers in his honor (Bancroft, 1972), and posthumously by the setting up in 1976 of *The George W. Snedecor Award for the Best Publication in Biometry*, administered by the ASA. He died in 1974, at the age of 92, in Amherst, Massachusetts.

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