

## Chapter II - The Emergence of Agricultural Engineering

Mechanized agriculture and rural electrification began to intrude on Texas before the turn of the Century. The Agricultural and Mechanical College became a manager, catalyst, and facilitator of the changes which resulted in greater agricultural and industrial production and a better and more abundant life. In those first two decades of the 20<sup>th</sup> Century, Texas A&M reconstituted itself to better manage the tasks associated with the instruction of the agricultural and mechanic arts, and more specifically to help Texas adopt and adapt to mechanization and electrification.

The Agricultural & Mechanical College of Texas began an academic restructuring that facilitated the mechanization and electrification of Texas' rural and urban populations. On September 3, 1883, Texas A&M hired George W. Curtis, Professor of Agriculture, replacing Carlyle P. B. Martin, who originally taught the "Agriculture and Scientific Course," and Roger Haddock Whitlock, became the first Professor of Engineering, on September 3, 1883. Under Whitlock's oversight mechanical engineering, electrical engineering, and scientific agriculture, became leading components of academic instruction and leading elements in the transformation of 20<sup>th</sup> Century Texas and American life.

Thomas Alva Edison developed the incandescent bulb in 1879, and launched Edison Electric in 1889. Westinghouse and General Electric followed closely. Most urban centers had electric power by 1900, but most rural areas in Texas lacked access to electric power for several decades. Bryan, Texas organized the "Water, Ice and Electric Company of Bryan" in the mid-1880s, and the Agricultural & Mechanical College established its own independent electrical generating plant in 1893, and at the same time established an independent Department of Physics and Electrical Engineering in 1903, which in 1909 divided into two independent academic departments, Physics, and Electrical Engineering. Agricultural Engineering was a concept being incubated.

The inception and growth of a national organization, the American Society of Agricultural Engineers (ASAE), organized by eighteen charter members in December 1907 at a meeting held at the University of Wisconsin, gave agricultural engineers a distinctive and national identity. "The object of this Society shall be to promote the art and science of

engineering as applied to agriculture.” In 1915, when Texas A&M’s Department of Agricultural Engineering came into being, the American Society of Agricultural Engineering boasted some 132 members. One of those was Daniels Scoates. Scoates served as the national president of ASAE in 1918. In 1919, he came to Texas A&M as Head of the Department of Agricultural Engineering, and quickly channeled the department faculty and students into a close and enduring relationship with ASAE. Years later, in 1979, Robert E. Stewart, then also a Past President and Fellow of ASAE as well as a Distinguished Professor of Agricultural Engineering at TAMU, wrote a definitive history of ASAE: *7 Decades that Changed America: A History of Agricultural Engineers, 1907-1977*, published by the American Society of Agricultural Engineers.

Change in the city and in the country accelerated with the introduction of the automobile, the mechanization of agriculture, and the electrification of the town and country. Ransom Olds began assembly line production of the Oldsmobile in 1897. Henry Ford launched Ford Motors in 1899, and produced Model T cars and trucks from 1908 to 1927. Deere and Company began to manufacture and market farm tractors and harvesters, as did International Harvester, Ford Motor, Rumely, Moline, Avery, Case Motors and others. In the 1920s Texas A&M’s Department of Agricultural Engineering began displaying tractors and farm equipment and providing instruction and information at an annual Farm Machinery Laboratory.

Texas A&M emerged from the 19<sup>th</sup> Century to help steer Texas into the 20<sup>th</sup>. The first automobile on the Texas A&M campus arrived in 1912 and was owned by Frederick Ernst Giesecke who had completed his engineering studies in 1886, and was immediately hired as an assistant professor at the age of seventeen with a salary of \$50 per month plus room and board. Texas A&M was on the edge of growth and change and Giesecke helped it build and grow. He was in many respects the literal “Aggie Architect of the 20<sup>th</sup> Century.”

Giesecke organized and became head of the Department of Mechanical Drawing in 1888 and for the next twenty-four years served as Texas A&M’s design and construction supervisor as an “aside” to his teaching duties. Following the destruction of the Mess Hall by fire in 1911, and of Old Main in 1912, Giesecke designed a new Mess Hall (Bernard Sbisà Hall) and an Academic Building and supervised the construction of both, and then within a few years designed and supervised the construction of three dormitories (Milner, Leggett, and Mitchell Halls) and the Alumni Memorial YMCA building, completed in 1913.

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One of the on-campus changes in 1911 greatly affecting current students and faculty as well as Texas A&M's academic future was the organization of the academic program under two "Schools:" Agriculture and Engineering. Edwin J. Kyle, who began his agricultural studies at Texas A&M in 1896, graduated with a degree in Agriculture in 1899, and then completed a Master of Science degree at Cornell University, returning to Texas A&M as head of the Department of Horticulture and the first Dean of the School of Agriculture. Agricultural courses taught at the time included Agronomy, Animal Husbandry, Farm Gas Engines, Farm Machinery, Biology, Dairy Husbandry, Entomology, Farm Management, Forestry, Horticulture, and Rural Social Science. Those "courses" generally evolved into independent Departments offering degrees in that curricula. James C. Nagle, Head of Civil Engineering, became the first Dean of the School of Engineering. In addition to its basic agricultural and engineering courses, Texas A&M offered a two-year "technical training" curriculum for "general" engineering, including electricians, power plant operators, textile operators, telephone service personnel, road supervisors and surveyors, and highway engineers. In 1911 the Civil Engineering Department began offering instruction in farm terracing, involving contour rows and elevated rows for the control of run-off and the retention of rain and irrigation water, and the conservation of soil moisture. The instructor responsible for those courses also provided assistance and instruction to Farmers' Institutes and to individual farmers, a role soon assumed by the Agricultural Extension Service. Texas' Agricultural Extension Service (TAES) was established under the terms of the Hatch Act of 1887 which provided federal funding for the establishment and operation of state-based agricultural experiment stations which provided both a laboratory and a testing facility for the inception and development of improved agricultural practices. The A&M Catalog of 1913-1914 highlighted the interface of engineering and terracing by the "Instructor of Terracing" who taught classes for one half of the scholastic year:

*...the remainder of his time being devoted to cooperative work with Farmers' Institute and individual farmers. Free lectures and demonstrations of terracing work are made on request at any point in the State. Exhibits for instruction in highway engineering and in terracing, are shown at the leading fairs and on demonstration trains for the purpose of giving as many people as possible an opportunity to become familiar with approved methods in these lines.*

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These initiatives by the A&M College, and soon others by Congress contributed to the inception of Department of Agricultural Engineering. In 1913 engineering faculty members on their own initiative organized an Engineering Experiment Station “to supply important information to the general public through printed bulletins, and to make important investigations in the field of engineering.” The following year (1914) Congress approved the Smith-Lever Act facilitating “cooperative agricultural extension work between the agricultural colleges in the several states....” The Texas legislature approved the provisions of the Act on May 8, 1914, and in August appointed a member of the Board of Regents of the University of Texas and former editor of *Texas Farm and Ranch* magazine as Director of Texas A&M’s agricultural extension programs. The Agricultural Extension Service, Agricultural Experiment Stations, and the Texas Engineering Experiment Station provided a direct connection between Texas citizens and their Land Grant College. The three tasks: **teaching**, **research**, and **extension** came to define the role and mission of Texas A&M and the Land Grant Colleges in the 20<sup>th</sup> Century.

Elmer C. Gee joined the Texas A&M faculty as Instructor in the Agronomy Department in April 1913. At the time the campus was literally “under construction” with three dormitories, Bernard Sbis Hall, the Academic Building, and the YMCA Building in progress. And Europe was on the edge of a catastrophic war. Gee was born and reared in Imogene, Iowa; attended Western Normal College in Shenandoah, Iowa from 1903- 1907, and then taught Mathematics and Commercial Subjects in the Grafton, North Dakota High School for two years before enrolling in graduate studies at the University of Nebraska. While in college he taught evening classes in Book-Keeping and Accounting in the National School of Commerce in Lincoln. Then while continuing his studies, he taught courses in Farm Machinery and Shop Practices to two-year farm students at the University of Nebraska. Gee earned his degree in Agricultural Engineering and moved to College Station, Texas where he was welcomed to the A&M campus by Dean Kyle and Prof. J.O. Morgan who headed the Department of Agronomy. Professor Morgan briefly discussed the two courses that were to be taught by Gee: Farm Gas Engines, and Farm Machinery which were offered only to seniors majoring in Agronomy and Animal Husbandry. For the past two years those courses had been taught by Prof. Sam McMillan, but McMillan had been transferred to San Antonio to work on irrigation experiments being conducted by the Agricultural Experiment Station.

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Dean Kyle and Morgan both urged Gee to reconstruct the Engines and Farm Machinery Laboratory which had been loosely organized about 1911, and “bring it up to modern practices.” That job meant contacting different manufacturers and “inviting” them to place equipment in the Laboratory on a loan basis for demonstrations and use in the instruction of students and for the information of Texas farmers and ranchers, many of whom were unaware of the advances being made in farm machinery, and many of whom tended to prefer the “old methods and equipment” to something new and unfamiliar. When he solicited “new and modern equipment from the Manufacturers,” Gee said, “I found them very cooperative. In June 1914, the Board of Directors promoted Elmer Gee from Instructor to Associate Professor...and that same month, on June 28, 1914, a Serbian nationalist assassinated Archduke Franz Ferdinand of Austria on the streets of Sarajevo, Bosnia—and the world came to the brink of war. For a time it was business as usual in the U.S. and at Texas A&M. The “usual” at the Agricultural and Mechanical College of Texas had to do with engineering the transformation of Texas agriculture. To assist in that effort on September 1, 1914, the Board of Directors organized a “Department of Agricultural Engineering” to be headed by Associate Professor Elmer C. Gee, remaining for a time a part of the Agronomy Department. Gee was to work under the supervision of and with support from the Professor of Agronomy, J.O. Morgan.

The next year, on July 6, 1915, resident Bizzell separated the Department of Agricultural Engineering from Agronomy and placed it under the authority of Professor Gee. Gee immediately began the search for additional faculty. Professor LeRoy Rhodes, a 1915 University of Nebraska Engineering graduate was hired to teach courses in Irrigation, and the Design and Construction of Farm Buildings.

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Fig. 2.1, Elmer C. Gee

The College Catalog for 1914-1915 noted that the Department of Agricultural Engineering “through the generosity of numerous branch houses and manufacturers was “well equipped with apparatus for lecture and laboratory experiments.” Those accessories, in addition the Rumely Oil Pull Tractor included “...*feed grinders and crushers, seed cleaning and grading machines, centrifugal and piston pumps, hydraulic rams, and farm lighting plants.*” There were seven different types of traction engines, including a ...*Buckeye traction ditching machine, 50-H.P. J.I. Case steam traction engine and road grader, two Hart-Parr kerosene tractors, a Bullock 75 H.P. creeping grip tractor*” and a *Holt, Moline, P.&O., B.F. Avery, John Deere, and Spalding deep tilling engine plows.* The Studebaker corporation donated a sectional model of a 35 H.P. automobile chassis complete with an electric starter, and ...*the irrigation and drainage laboratory is equipped with levels, ranging poles, rods, tapes, hand axes, pins, etc.; also with spades and drain cleaners for laying out farm drainage and irrigation systems.*” The new age of mechanized agriculture was dawning.

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