

The Beginning of Agricultural Engineering at Penn State

By
Albert R. Jarrett

The history of Agricultural Engineering as a profession begins before we had machines, iron, steel or plastic. It begins when people realized they could make their lives easier by utilizing pieces of wood or stone. The concept and basis of what we call agricultural engineering originated when people realized the need for a sustainable food supply, shelter, and the need to protect themselves.

As late as the 1700s people were still using oxen, mules, and horses to provide power, seedbeds were prepared with crude wooden plows, seeds were sown by hand, cultivation was with a handheld stick, and threshing was done with a flail or by walking cattle through the harvested grain. Many of the early labor saving devices and machines were the inventions of creative individuals who saw a need, had an idea and worked hard to make the idea into reality. The cotton gin, invented by Eli Whitney in 1793, revolutionized the cotton industry in the United States. The struggle to enhance seedbed preparation, starting with the plowing of the soil, with early efforts by Thomas Jefferson (1794), Charles Newbold (1797) and finally a patented iron plow by Jethro Wood in 1819. John Deere began manufacturing steel plows in 1837. The McCormick reaper in 1834 made harvesting small grains cheaper and easier, and the grain elevator was introduced in 1842. Steam powered tractors were introduced in 1868. Barbed wire was introduced in 1874. Horse and mule-drawn combines were introduced in 1880s and 90s. George Washington Carver pioneered new uses of peanuts, sweet potatoes, and soybeans, thus diversifying southern agriculture. Big open-g geared gas tractors came into use between 1910 and 1915.



Photo retrieved from archives within the Department of Ag Engineering

In America, there was a push by state and local agricultural societies to bring science into agriculture. The emergence of schools willing to focus their coursework on agriculture (at the expense of the classics) was a struggle. The school that became Penn State was no different. See Appendix A for a summary of Penn State's beginnings.

Driven by the enhancement of reliable, inexpensive internal-combustion engines developed during World War I, farmers began to replace human, horse, mule, and oxen power with machines. By the 1920s, gasoline-powered tractors were supplanting horses, mules, and even steam-powered tractors.

In 1920, tractors could be found on 3.7% of Pennsylvania farms. By 1930 that number had risen to 15%.

A big boost to farm electrification came in 1927, when the Pennsylvania Public Service Commission ordered utilities to supply rural customers at a monthly rate not to exceed 2% of the cost of installing the lines. Inexpensive electricity was brought to 22,000 farms over the next five years.

In 1892, in an effort to keep pace with advances in agricultural technology and to address emerging topics like tillage, farm machinery, and soil drainage a few faculty (there were no “Colleges”, “Schools” or “Departments” in those days) recommended adding an engineer to the College faculty [See Appendix B for a description of the events that led to the programs we have today.] These early efforts lead to the development of several correspondence courses, which dealt with many of these topics. By 1904, a baccalaureate-level course entitled “Agricultural Engineering Lectures” had been developed and was required by all Penn State students. In 1907, following the creation of the first “Schools” (we call them “Colleges” today), the School of Agriculture organized and created the Department of Agronomy, the first of what was to become many departments.

Also in 1907, the American Society of Agricultural Engineers (ASAE) was founded as colleges and universities throughout the nation were seeing the need for engineering-related courses and research in areas related to agriculture.

The Agronomy Department offered 12 courses in 1907, two of which had to do with engineering on the farm (Risius et al., undated). The first full-time instructor in farm equipment was Ralph Upshaw Blasingame (see Figure 1), an agricultural engineer, hired July 1, 1913 to teach courses in the Department of Agronomy. Blasingame’s path to agricultural engineering is interesting. Having grown up in Russell County, Alabama, he attended Alabama Polytechnical Institute where he received his first B.S. degree in civil engineering in 1908. Two years later, in 1910, he received his second B.S. degree in agricultural engineering and then moved to Cooper Industrial School in Cooper, TX as the school principal, where he met his wife. Shortly thereafter, Ralph moved to Ames, IA and in 1913 received his third B.S. degree in agricultural engineering from Iowa State College of Agriculture and Mechanic Arts. An interesting sidelight is that during his time at Iowa State College, he met Arthur W. Clyde, also a student in agricultural engineering at ISC. Having finished his degree program at ISC, Ralph was appointed Instructor in Agronomy at Penn State in 1913. Two years later, in 1915, apparently seeking a promotion, Ralph left Penn State and returned to Alabama Polytechnical Institute as professor of agricultural engineering. Then in 1917, he rejoined the Penn State faculty as associate professor of agronomy with a salary of \$2,700 in 1919. (PSU, 1911-1934).



Figure 1. Ralph U. Blasingame.

Blasingame established the Department of Farm Mechanics (Machinery), approved by the Board of Trustees November 5, 1920, (PSU, 1911-1934) with the mission of teaching only agriculture students. This new department was listed as a “service department” in the School of Agriculture. Throughout the 1920’s, the Department offered courses to students in other majors, yet had no baccalaureate program of its own.

During 1920 and 1930, there were several efforts made by Blasingame to change the name of the Department from “Farm Machinery” to “Agricultural Engineering”. Bezilla (1987) relates that when

Blasingame requested that the Departmental name be changed to include the word “engineering”, Robert Sackett, Dean of the College of Engineering frowned upon Agriculture’s attempt to undertake work in an area he considered more properly belonging in his own sphere. In order to win approval from the Board of Trustees for the Department of Agricultural Engineering, Ralph Watts, Dean of the School of Agriculture, had to secure the prior blessing of Dean Sackett. By 1929, Blasingame reported that Sackett was offering “sincere and determined opposition” to any expansion of the farm machinery department and would not have been unhappy to see its demise. Only by convincing the College of Engineering’s administration of the need for a baccalaureate curriculum in agricultural engineering was Dean Watts able to override this opposition. We are not told, what finally changed Dean Sackett’s mind. On March 27, 1930, the first curriculum in Agricultural Engineering (see Peikert, 1976) was approved, the Department of Farm Machinery’s name was changed to the Department of Agricultural Engineering, and Ralph U. Blasingame was appointed the first Head of this new Department.



Figure 2. J. R. Haswell, First Extension Ag Engr.

Also during this decade-long period of transition, the Department began to grow and add more faculty and staff. The faculty of the Department are listed in Appendix C. February 1, 1920 John (Jack) Robert Haswell (Figure 2) was appointed the first Extension agricultural engineer. His schooling started at Baltimore Polytechnic Institute. He soon transferred to Cornell University, where he earned a B.S. degree in Civil Engineering in 1909. The first ten years of his career was as a drainage engineer with the U.S. Department of Agriculture. In 1920, Jack was appointed to the Extension staff in the College of Agriculture at Penn State. Haswell was a licensed P.E., had served as a captain in the Army Corps of Engineers in WWI, was a fellow in ASAE, and a Tuscania Survivor. In 1927, Roy Johnson (Figure 3) was appointed as a technician to the Department.



Figure 3. Roy Johnson, first technician.

John Edward Nicholas (Figure 4) was appointed to the department faculty in 1929. John earned his B.S. degree in mechanical engineering from Lehigh University in 1915. He spent the next six years as a Mechanical Engineer for Bethlehem Steel Corp. In 1926 he earned his M.S. degree in ME from MIT and then taught thermodynamics at the University of Minnesota from 1926 to 1929 after which he was appointed as an associate professor of farm machinery at Penn State. Nicholas was a very productive faculty member with a focus in application of electricity to agriculture. He published over 100 papers and was a fellow in ASAE.



Figure 4. John Nicholas.

Blasingame provided leadership to the Department of Agricultural Engineering until his retirement in 1951 at which time Arthur W. Clyde was appointed acting head. Clyde led the department until Frank W. Peikert was appointed head August 1, 1954. Interestingly, one of Peikert’s first activities was to hammer out the now famous memorandum of understanding establishing joint administration of the Department by both the Colleges of Agriculture and Engineering. The memorandum was signed September 28, 1954, this time by Dean Jackson from the College of Agriculture and Dean Eric Walker from the College of Engineering; just two months after Peikert assumed the role of Head of Department (see Figure 9).

Jackson from the College of Agriculture and Dean Eric Walker from the College of Engineering; just two months after Peikert assumed the role of Head of Department (see Figure 9).

Ralph Blasingame was a very aggressive leader. In 1945 he taught at the American University of Shrivenham, an English College for servicemen. He organized the North Atlantic section of ASAE in 1925. He served ASAE as President from 1936 to 1937.

Blasingame's list of publications includes detailed treatises on "Home Electrification", "Some New Objectives in Preparing College Men for Industry", and "Potato Production Employing Only Tractor Power". After his retirement on December 31, 1951, Ralph traveled to Puerto Rico for the Agricultural Experiment State and contributed to their work on coffee.

Soon after the first academic program was approved, ASAE approved the creation of the Student Branch, with the first president being Ray Bressler.



Figure 5. Arthur W. Clyde.

The first faculty member hired to the new Agricultural Engineering Department was Arthur W. Clyde in 1931 (see Figure 5).

Also during this period the first research project in Agricultural Engineering (Project No. 705) "A Study of Power and Labor Factors Involved in Crop Production in Pennsylvania" was started.

This first curriculum in Agricultural Engineering offered students the following courses (five of these courses were degree requirements, see Figure 6):

- Agr. Eng. 1. Fam Utilities and Structures.
- Agr. Eng. 3. Field Machinery.
- Agr. Eng. 2. Elementary Farm Power.
- Agr. Eng. 4. General Farm Equipment.
- Agr. Eng. 6. Creamery Equipment.
- Agr. Eng. 7. Land Drainage and Irrigation.
- Agr. Eng. 8. Farm Shop Work.
- Agr. Eng. 13. Home Ground Improvement.

According to the June 8, 1931 Commencement Bulletin (PSU, 1911-1934), the first degree in Agricultural Engineering was awarded to George Mills Foulkrod of State College. The Department records (Peikert, 1976) shows the first B.S. degrees in Agricultural Engineering were awarded in June 1932 to J. G. Huda and J. H. Walker. In September 1931, David C. Sprague was appointed as an instructor and taught several courses while working on his master's degree under John Nicholas. In June of 1933 the first M.S. degree in Agricultural Engineering was awarded to David C. Sprague.

FIRST PENN STATE AGRICULTURAL ENGINEERING CURRICULUM

FRESHMAN YEAR

| <u>First Semester</u> | <u>Credits</u> | <u>Second Semester</u> | <u>Credits</u> |
|---------------------------------|----------------|---------------------------------|----------------|
| Agr. 1. Survey of Agriculture | 1 | Chem. 4. Inorganic Chemistry | 3 |
| Agr. Eng. 4. General Farm Equip | 3 | D. H. 1. Principles of Dairying | 3 |
| Bot. 27. Principles of Botany | 3 | Dr. 1. Mechanical Drawing | 2 |
| Chem. 3. Inorganic Chemistry | 3 | Engl. Comp. 5. Exposition | 3 |
| Engl. Comp. 1. Composition | 3 | Math. 7. Analytical Geometry | 4 |
| Hygiene 1 | 1 | Sur. 44. Surveying | 1 |
| Math. 5. Trigonometry | 4 | Physical Education 2 | 1 |
| Physical Education 1 | 1 | ROTC 2 | 1 |
| ROTC 1 | 1 | Fees. \$15.00 | |
| Fees. \$15.50 | | | |

SOPHOMORE YEAR

| <u>First Semester</u> | <u>Credits</u> | <u>Second Semester</u> | <u>Credits</u> |
|--|----------------|--------------------------------------|----------------|
| Agr. Eng. 1. Farm Utilities & Structures | 3 | Agr. Eng. 2. Elementary Farm Power | 3 |
| Dr. 2. Descriptive Geometry | 2 | Engl. Comp. 16. Technical Writing | 2 |
| Hort. 2. Comm. Fruit Growing | 3 | Hist. 25. Contemporary History of US | 3 |
| Engl. Comp. 7. Argumentation | 2 | Math. 11. Integral Calculus | 4 |
| Math. 10. Differential Calculus | 4 | Phys. 261. Electricity and Magnetism | 2 |
| Phys. 211. Mechanics and Heat | 2 | Phys. 262. Electrical Measurements | 2 |
| Phys. 212. Physical Measure | 2 | Physical Education 4 | 1 |
| Physical Education 3 | 1 | ROTC 4 | 1 |
| ROTC 3 | 1 | Fees. \$8.00 | |
| Fees. \$11.00 | | | |

JUNIOR YEAR

| <u>First Semester</u> | <u>Credits</u> | <u>Second Semester</u> | <u>Credits</u> |
|-------------------------------------|----------------|---------------------------------|----------------|
| Agro. 6. Soils | 4 | Agr. Econ. 6. Farm Management | 3 |
| Agro. 28. Intro. To Farm Crops | 3 | Agr. Eng. 3. Field Machinery | 3 |
| Mchs. 1. Elementary Mechanics | 4 | Hyd. 1. Hydraulics | 2 |
| M.E. 101. Elements of Power Engr. | 2 | Hyd. 3. Hydraulic Laboratory | 1 |
| M.E. Des. 102. Kinematics of Mach. | 2 | Mchs. 2. Applied Mechanics | 4 |
| Met. 59. Metallurgy of Iron & Steel | 2 | M.E. 104. Thermodynamics | 3 |
| Fees. \$7.50 | | Pol. Sci. 13. Political Parties | 3 |
| | | Fees. \$4.00 | |

SENIOR YEAR

| <u>First Semester</u> | <u>Credits</u> | <u>Second Semester</u> | <u>Credits</u> |
|------------------------------------|----------------|--|----------------|
| Agr. Eng. 7. Drainage & Irrigation | 3 | E.E. 9. Industrial Electrical Applications | 2 |
| Econ. 14. Principles of Econ. | 3 | El. Lab. 9. Electrical Engineering Lab. | 2 |
| E.E. 8. Dynamics of Machinery | 2 | Electives | 6 |
| El. Lab. 8. Electrical Engr. Lab | 2 | Fees. \$8.00 | |
| Mchs. 3. Engineering Materials | 1 | | |
| M.E. Des. 103 Machine Elements | 4 | | |
| Electives | 3 | | |
| Fees. \$8.00 | | | |

Figure 6. First Agricultural Engineering Curriculum, approved March 27, 1930

Agricultural Engineering was now a Department, but had very limited facilities. The Department was scattered over several parts of the campus. The general office was in the Horticulture Building (now Weaver Building). John Nicholas and A. W. Clyde had offices in Patterson Building and Nicholas has his rural electrification laboratory in the basement of that building. The power and machinery

laboratory was in the basement of a horse barn, which stood on Shortledge Road approximately on the site of Fenske Laboratory. A shed adjacent to the barn also housed some machinery. The

department had a shop in a brick building, which was formerly a boiler house for Ag Hill located behind Fenske Laboratory. One of the early buildings is shown in Figure 7.

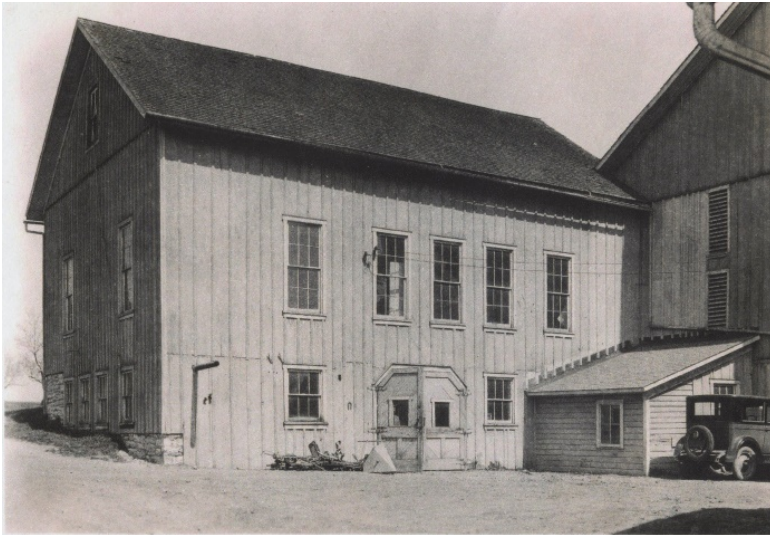


Figure 7. First home of Agricultural Engineering Department.

On April 23, 1937, the Agricultural Engineering Department was approved by the Board of Trustees to receive a new building. The minutes from the Board of Trustees meeting reads “On a motion by Mr. Musser and seconded by Mr. Slocum, it was voted to authorize the officers of the College and the architects to study the proposed location for the Agricultural Engineering Building, and, if in their judgment it seems desirable, to change its location within the general area north of the Dairy Building, it shall be done (PSU, 1911-1934).

Immediately following, it was moved,

seconded, and carried that “the following projects: Control Unit of Liberal Arts Building; Water System; Forestry; Education; Library; Mineral Industries (wing); Science (agricultural Chemistry and Zoology); Electrical Engineering; Physics and Chemistry; **Agricultural Engineering**; Mechanical Engineering (two wings); Textile Chemistry (two wings); Infirmary; Service and Storage Building; Service Lines and Additions to Power Plant; Landscaping Roads and Walks; be recommended to the General State Authority with the understanding that if limiting funds makes necessary withdrawals be made, the withdrawals should be taken from the following projects: Mechanical Engineering (two wings); Textile Chemistry (two wings); and the Infirmary (one wing) (PSU, 1935-1954).

With the prospect of new facilities promised, Department Head Blasingame asked David Sprague to send letters to each agricultural engineering department in the US and Canada and ask them for the following:

1. A photo of your Agricultural Engineering Building.
2. What is the approximate size and cost of you building and when was it built?
3. How many men are employed in your department?
4. What is your total budget for research and instruction?

The answers to this inquiry were found in a file with all of the pictures and data collected. In some cases they sent engineering drawings. How, or if, the data collected by Sprague were used in the preparation and design of the new building is not known.

This effort resulted in the Agricultural Engineering building we have all known (Figure 8). The corner stone on this building is 1938, but this 20,000 square foot building was not dedicated until November



Figure 8. 1937 Agricultural Engineering Building.

14, 1940. We have a copy of the dedication program (Peikert, 1976) and a copy of Blasingame's dedication speech.

This new building was welcomed, but it provided only limited laboratories, classrooms, and office space for the staff. When the original building was first designed the plans included laboratories for both tractors and farm machinery. However, only the tractor wing was constructed. There was not provision for expansion of staff and programs. However, the facilities in the new building were far better than the department had had up to that time. It was soon recognized that additional space was required if the department's programs were to expand and grow. On January 26, 1944, Dean S. W. Fletcher of the School of Agriculture sent a memo to department heads requesting information on physical plant needs. The department requested a two-story wing, 40 feet by 110 feet to be placed across the back of the existing tractor laboratory. This was never approved and the original building of 20,000 square feet was all the space the department had until 1969 (Peikert, 1976) when the facilities were completed. The 1969 expansion included a new shop, large machinery, structures, and food engineering laboratories, and a second floor to house faculty, staff and graduate students.

The Department of Agricultural Engineering has grown and been transformed into a dynamic forward-thinking program with a global mission. Some of the key dates, leaders, and program changes are summarized below:

- In October 1956 the Agricultural Engineering curriculum was accredited for the first time.
- In 1959, the Dean of Engineering initiated the Industrial and Professional Advisory (IPAC) program to have each department in the College of Engineering bring to campus a selected group of industry representatives to advise the department about issues confronting the department each year.
- In June 1964, the Agricultural Mechanization curriculum was approved. This new program, based on agricultural technology, business, and science, produced College of Agriculture graduates.
- In 1968, the Ph.D. program in Agricultural Engineering was approved. The first Ph.D.'s awarded were in 1972 to Robert M. Butler, Mahesh M. Kumar, and Suresh D. Sawant.
- The Omicron Chapter of Agricultural Engineering's honor society, Alpha Epsilon, was chartered in 1969.
- August 1975 F. W. Peikert retired as head of the Department and H. D. Bartlett was appointed acting head.
- June 1976 H. V. Walton was appointed head of the Department.
- July 1985 H. V. Walton retired as head of the Department and in August of that same year, D. E. Buffington was appointed head of the Department.
- In November 1990 the name of the Department was changed from Agricultural Engineering to Agricultural and Biological Engineering. This name change was part of a nationwide transformation within the profession of Agricultural Engineering spurred on by the integration of more biology and microbiology into the curriculum.
- During 1990 to 1996 the Agricultural Mechanization program underwent several name changes from Agricultural Mechanization, to Agricultural Systems Management and Technology, to Agricultural Systems Management.
- June 1996 D. E. Buffington resigned as head of the Department and H. B. Manbeck was appointed interim head.
- July 1998 R. E. Young was appointed head of the Department.
- June 30, 2010 R. E. Young retired as head of the Department.

- July 1, 2010. P. H. Heinemann was appointed head of the Department.

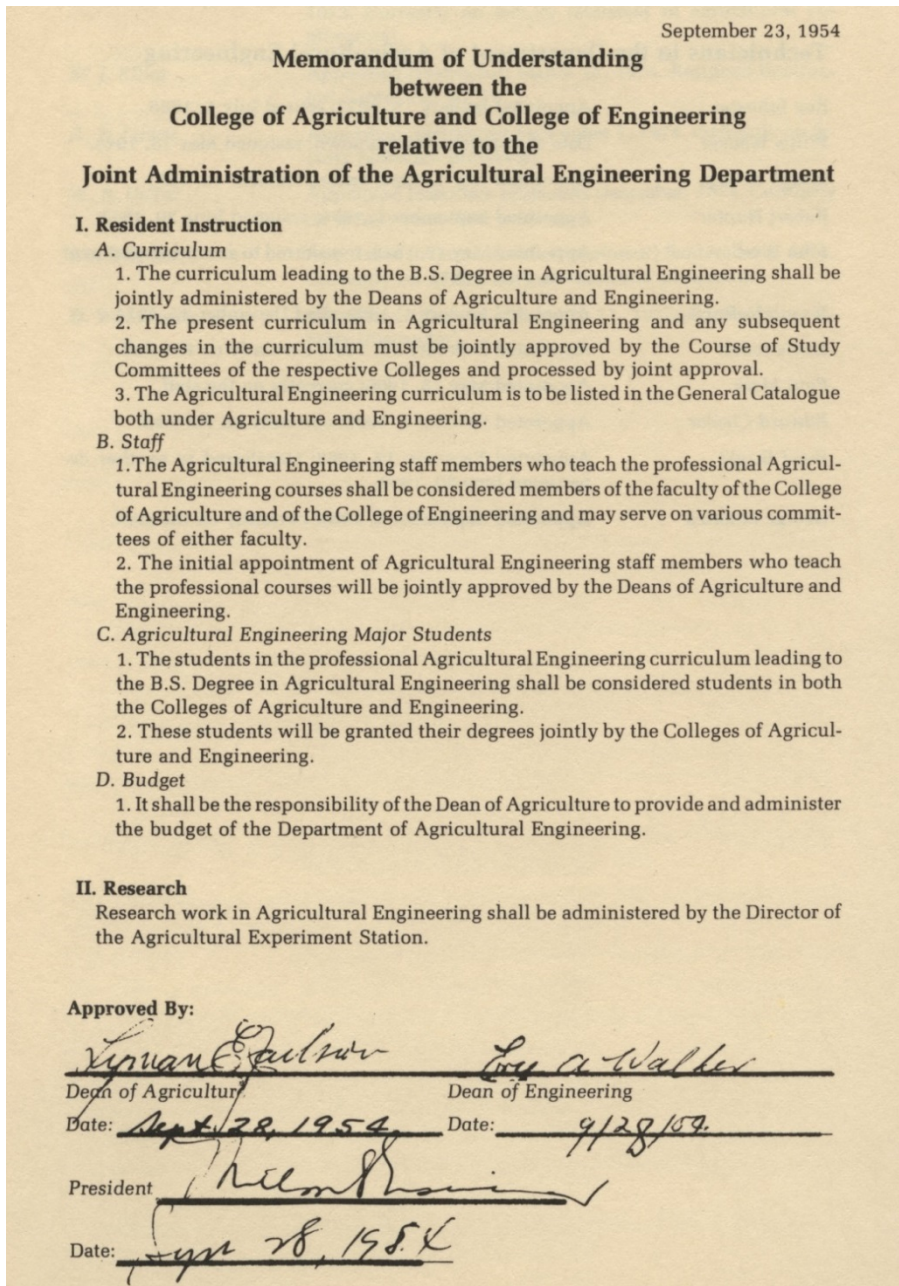


Figure 9. Joint Administrative Agreement.

The Department of Agricultural and Biological Engineering had been struggling with space issues; space to house faculty, staff, graduate students, and post docs for many years. Since 1969 there has also been a complete transformation of the type of research conducted by department faculty and graduate students; from large, hands-on measurement oriented research to microbiology, energy-focused, computer modeling research efforts. The 1969 building also had limited classroom space. In 2013, the University set aside \$44.5 million for new facilities for the Department. This new building will house classrooms, laboratories, and common areas to accommodate the expanding Department and its cutting-edge research, teaching, and extension programs. The Department has evolved from a small group of faculty focused on farm machinery to an international leader addressing the most critical issues facing the world today – food production, water and energy security, and the development of sustainable bio-based materials. This new 93,000 square foot building will open the door to the future of Agricultural and Biological Engineering. The new building is targeted to be completed in December 2017.

References

Bezilla, M. 1985. Penn State; An Illustrated History, The Pennsylvania State University Press, University Park, PA.

Bezilla, M. 1987. The College of Agriculture at Penn State. The Pennsylvania State University Press, University Park, PA.

Peikert, F. W. 1976. History of Agricultural Engineering at Penn State: 1892-1976. Published by the Department and available at <http://abe.psu.edu/about/brief-history-of-department/abe-history-volume-one>

PSU. 1911-1934. Board of Trustees, Minutes. Volume 3, Part 1, 1911-1934.

PSU. 1935-1954. Board of Trustees, Minutes. Volume 4, Part 1, 1935-1954.

Risius, M., Starling, J., and Sylvia, D. undated. Agronomy at Penn State: The History and Selected Achievements of the Department of Crop and Soil Science: 1907 -2007. Ag Communications and Marketing. College of Agricultural Sciences. Penn State University.

In addition to the references above, the content of this article was compiled by the author from a variety of unpublished sources, mostly from the Penn State Archives.

Appendix A

Summarized from Bezilla, 1985.

Under the leadership and vision of Frederick Watts, who was a member of the Philadelphia Society for the Promotion of Agriculture (founded in 1785), this group was dedicated to the application of science to agriculture. On January 21, 1851 the Pennsylvania State Agricultural Society, formed from representatives from the many local Pennsylvania Agriculture Societies, held a meeting in Harrisburg to discuss “scientific agriculture”. Several hundred delegates from 55 counties attended. At this meeting Frederick Watts was elected president. Watts resolved to make the founding of an institution to teach and study scientific agriculture the society’s principal objective.

In January 1853, at the society’s second annual meeting, a commitment was made to meet again in March in Harrisburg to adopt a course of action focused on starting the much needed institution. At the March meeting, Watts outlined the basic organization and objectives of the proposed school. These included:

- Access to agriculture markets.
- Not near a large town.
- Student would be required to perform manual labor.
- Studies were to include:
 - Agricultural subjects, and
 - A sampling of classical subjects.
- The school was to be named “The Farmers High School” to make the point that this school would be different from traditional “classics” colleges.
- The school would teach collegiate grade academic work, and
- Award baccalaureate degrees.

On March 11, a bill to incorporate “The Farmers High School” was introduced into the State Senate and ignored. The same bill was introduced the following year and passed. It was signed by Governor William Bigler, April 13, 1854. The development of this new school was turned over to 60 Trustees, made up of the presidents of the 60 county agricultural societies.

In June 1854, the trustees met to discuss the procurement of a site for the institution. There was no quorum. A second meeting failed (no quorum). The General Assembly then reduced the number of trustees to 13. This group then developed a charter, which was signed by Governor James Pollock February 22, 1855, the published birth date of the school that became Penn State.

The Board of Trustees met June 14, 1855 to select a suitable site for the school. They had proposals from five counties, each willing to donate or sell 200 or more acres for the school. There were offers from Erie, Centre, Blair, Perry, and Allegheny Counties. One of the leading offers was from James Irvin of Bellefonte, who was willing to give any one of three 200-acre tracts. No action was taken because the trustees wanted to visit each of the sites before voting.

The Board of Trustees reconvened on September 12, 1855. By this time there was a sixth offer, from Franklin County. More importantly, the Centre County offer by James Irvin had been enhanced by Hugh McAllister (a Board of Trustees member from Bellefonte) and Secretary of Pennsylvania, Andrew G. Curtin (also of Bellefonte) who had raised \$10,000 to get the school started. The Centre County offer was accepted and signed at a dinner held at the Centre Furnace Mansion.

Construction of the “building”, what we know as Old Main took from 1855 to 1858. Funds and materials were an issue. The project was nearly abandoned several times.

At the Board of Trustees meeting on Dec 1858, they set February 16, 1859 as the start of school. Tuition and room and board was set at \$100/year (1/3 the rate at other colleges in the state). On February 16, 1859 the first class arrived. There were 69 students.

The school had four faculty members:

- William Waring, Professor of horticulture.
- Jacob S. Whitman, Professor of natural science.
- R. C. Allison, Professor of English.
- Samuel Baird, Professor of mathematics.

The first class graduated in 1861.

Appendix B

This historical description was taken nearly verbatim from Risius et al. (undated).

Founded in 1855 as the Farmers High School, it is a miracle in many respects that the tiny college with a few dozen students located in the “wilderness” should survive, much less become the internationally recognized university that Penn State is today. The road to prominence, however, has at times been rough. Among the nation’s great land-grant universities, few, if any, had a more perilous beginning than did Penn State. In the early years, critics were displeased about the location, mission, leadership, and its quality and resources were indeed meager and uncertain. In its first 25 years, six individuals served as its president, and only Evan Pugh, its first, found the rustic facilities acceptable. Within the first 10 years, it changed its name twice – first in 1862 to the Agricultural College of Pennsylvania and in 1864 to the Pennsylvania State College, a name it would retain for the next 90 years until “College” was changed to “University” in 1953. Of all the actions that occurred within the first 100 years of the institution’s existence, none was more rewarding than being designated by the state legislature in 1863, in competition with several other colleges, as Pennsylvania’s land-grant college.

After Pugh’s death, which occurred just as he was beginning his presidency, the faculty reflected diminished interest in agriculture and the Farmers High School was in danger of becoming another Pennsylvania institution more interested in educating students in the classics than in applied fields. In some years, no students enrolled in agriculture, which encouraged faculty to think in that direction. The Agricultural College of Pennsylvania indeed had trouble attracting students for any discipline. Neither the campus nor the adjoining village offered many comforts or recreational opportunities. Even those from farms and rural areas found the institution unappealing. For a period of time, no tuition was charged in an effort to attract students. Early versions of the college catalog listed all students along with faculty and staff. For a few years, even the grade-point averages for all enrolled students were listed for the world to see.

Among those disciplines offered by the fledgling faculty of the Farmers High School, agronomy was one of the strongest. While no discipline can claim great depth in the first faculty of five, who covered subjects ranging from the classics to animal husbandry, agronomy was represented by no less a person than Dr. Evan Pugh, the school’s first president. With his background in farming, his interest and experimentation in plant nutrition, and his research in soil chemistry, Pugh could clearly have held an appointment in a contemporary agronomy department had such a department existed in his time. Due to the untimely death at an early age, Pugh’s influence and leadership in the discipline was short lived. Decades would pass before any other faculty member would bring leadership and visibility to the school. Clearly facets of agronomy had to be taught if degrees were to be offered in “applied agriculture”.

From the start, the few agriculture faculty devoted considerable time to workshops and meetings for the farming public. Extension was an early and significant activity for these academic pioneers. In addition to extension, early faculty in agriculture did some research in the years before the Agricultural Experiment Station was founded.

Despite many challenges, the school developed structure, particularly under the leadership of President Atherton, who came on board in 1882. As the college grew, it became appropriate to create administrative structure, which led to the creation of schools in 1895. The School of Agriculture’s first dean was Henry Prentise Armsby. It would be up to Armsby’s successor, Dean Thomas Hunt, to create designated departments within the School of Agriculture. In the 1906-07 academic year, only 39 students were enrolled in Agriculture. Completion of the Armsby Calorimeter and Agricultural

Building (Armsby) provided visibility to the school and significant new space for faculty offices, classrooms, and laboratories. Several departments, including agronomy were created in 1907.

Actions at the federal and state levels that had major ramifications for the college, particularly its agricultural sector, included passage of the Hatch Act, which led to the establishment of the Agricultural Experiment Station in 1887 and the creation of the Agricultural Extension Service in Pennsylvania in 1907. Extension was also significantly enhanced by subsequent passage of the Smith-Lever Act in 1914, which provided for federal funding to partially support extension activities in the nation's land-grant institutions.

Appendix C

Faculty assigned to what became the Department of Agricultural Engineering

First evidence of what was to become the Department was July 1, 1913 when Ralph U. Blasingame was appointed by the Department of Agronomy as an Instructor.

In 1914, Blasingame is listed with the faculty of Agronomy.

From Sept 1914 to April 1915, Blasingame is listed with Agronomy with the title of "Rural Engineering".

Blasingame resigned July 1, 1915 to return to Alabama Polytechnical as professor of agricultural engineering. From July to August 1915, no mention is made of an engineer in the Agricultural Experiment Station bulletins or annual reports.

R. A. Andree was appointed instructor in Agronomy September 1, 1915 and is listed with the Agronomy faculty with responsibility in "Farm Machinery" until October 1, 1917, when he resigned.

October 20, 1917, Ralph U. Blasingame was reappointed to Agronomy as associate professor of farm machinery. Blasingame fulfilled the Farm Machinery responsibilities in Agronomy until July 1, 1919 when G. M. Foulkrod joined Blasingame as instructor in agronomy.

February 1, 1920, Jack R. Haswell was appointed assistant professor of farm machinery Extension. Prior to the 1940s, Extension was considered a separate group from the teaching/research faculty. Jack was not listed with the Farm Machinery faculty.

November 5, 1920, the Department of Farm Machinery was approved by the Board of Trustees and Blasingame became Head of this new department. Blasingame and Foulkrod were the Department of Farm Machinery until September 1924 when E. Grant Lantz was appointed instructor in Farm Machinery.

September 1, 1925, H. B. Josephson was appointed assistant professor of farm machinery. The Department now had a faculty of four; Blasingame, head, Foulkrod, Lantz, and Josephson.

Following the action by the Pennsylvania Public Service Commission in 1927 to push rural electrification, W. D. Hemker was added to the Department with responsibilities in rural electrification.

The Department remained the same until J. E. Nicholas was hired July 1, 1929 as associate professor of farm machinery. The Department was a faculty of four with; Blasingame, head, Foulkrod, Josephson, and Nicholas.

March 27, 1930, after a decade-long battle with the College of Engineering, the Department of Farm Machinery became the Department of Agricultural Engineering.

With the appointments of A. W. Clyde July 1, 1931, and D. C. Stapleton and D. C. Sprague September 15, 1931 the Department began to grow.