

The first in a series of articles on the history of the Department of Civil and Environmental Engineering

Part One: 1867-1926

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The Department of Civil and Environmental Engineering had its birth in 1867 when it was named as one of four branches of the Polytechnic Department of the University. The University catalogue for 1868-69 listed a faculty position in "Civil and Rural Engineering," but that position was not filled. However in the 1869-70 catalogue, Samuel Walker Shattuck was identified as "Professor of Civil Engineering," and the department appears to have been on its way.

Nevertheless, during the 1870-71 academic year, University records show the department as having been administered by Professor Stillman W. Robinson, head of the Department of Mechanical Science and Engineering, and as having a faculty that consisted of Shattuck as professor of mathematics and Professor Alexander Thompson as teacher of railroad engineering with leadership responsibility for the CE department. Finally, in 1871, John Burkett Webb was appointed as Professor of Civil Engineering and head of the department. With that, the department had become a reality.

The department continued to grow under the headships of John B. Webb (1871-

78), Ira O. Baker (1878-1915 and 1920-22), Frederick H. Newell (1915-20), and Clement C. Williams (1922-26). It was during this period, 1867-1926, that the foundation was laid upon which succeeding department heads were able to build a department of internationally distinguished reputation. It is this early period of the department's development on which attention is focused in this writing; similar articles to follow in later issues will speak to the further development of the department in the years that followed.

"This school is designed to make good practical Engineers, thoroughly prepared for all branches of Engineering work, Railroad surveys, Topographic and Geodetic Surveying, Bridge building, Government surveying, etc."

—Board of Trustees, 1870-71

It was clear from the beginning that the department recognized clearly not only its responsibility to instill the knowledge of the profession then extant in the minds of aspiring students, but also to generate new knowledge that could be used to advance the effectiveness of those in the practice of

the profession, and, thereby, to serve better those needs of society that are met by civil engineers. Illustrative of the objectives of the department (frequently referred to as a "school" at that time), even in its very early years, are the following quotations that were taken from University publications of that era:

From an 1870-71 report of the Board of Trustees: *"This school is designed to make good practical Engineers, thoroughly prepared for all branches of Engineering work, Railroad surveys, Topographic and Geodetic Surveying, Bridge building, Government surveying, etc."*

From an 1872-73 University Catalogue and Circular: *"The School is designed to furnish a course of theoretical instruction accompanied and illustrated by a large amount of practice, which will enable students to enter intelligently upon the various and important duties of the Engineer. Those who desire a preparation, at once broad and thorough, and who are willing to make persevering effort to obtain it, are cordially invited to connect themselves with this school."*

From an 1890-91 University Catalogue and Circular: *"While the instruction aims to be practical by giving the student information and practice directly applicable to his future professional work, the prime object is the development of mental faculties. The power to acquire information and the ability to use it, is held to be of far greater value than any amount of so-called practical acquirements."*

As the program of instruction of the department developed, so did laboratories that were needed not only to support that instruction, but also to provide the space and physical facilities that were needed to foster the research objectives of the department. According to records now available, initial efforts in laboratory equipment development were focused on the acquisition of surveying instruments. Evidence of this interest in the surveying component of the early curriculum is seen in the following statements that were taken from the 1890-91 issue of the University Catalogue and Circular:

“The school is provided with the instruments necessary for the different branches of engineering field practice, including chains, tapes, compasses, plane tables, stadias, transits, levels, barometers, base rods and comparing apparatus, sextants, engineer’s transits arranged for astronomical observation, and solar compass attachments for transit.

“A portable altitude and azimuth instrument of the latest and best form from the celebrated makers, Troughton & Simms, of London, is used for instruction in geodesy and practical astronomy. It is read by micrometer microscope to single seconds, both of altitude and of azimuth. The astronomical observatory is provided with an equatorial telescope, and astronomical transit, with attachment for zenith telescope work, a chronometer, and a set of meteorological instruments.”

In view of the emphasis then given to surveying instruction, this is not unexpected. Interestingly, surveying continued to hold a strong place in the undergraduate curriculum until the early 1950’s, requiring at that time 10 semester hours for all students, and an additional six hours of surveying electives for use by some students. How times have changed! As of this writing, the department offers no courses in surveying.

In 1889, Professor Baker established a “Cement and Masonry Laboratory,” later to be known as the “Cement and Concrete Laboratory,” and a companion “Road Materials Laboratory,” which dealt primarily with stone, gravel, brick and bituminous materials, was established in 1906. In 1923, the work of this laboratory was split into two separate units, a “Bituminous Materials Laboratory” and a “Non-Bituminous Materials Laboratory.” In a closely related development, a structural research laboratory, the initial focus of which was the experimental study of reinforced concrete,

was established in 1923. All three of these laboratories were first located in temporary space, but were moved into the new “Materials Testing Laboratory” (later to be known as “Talbot Laboratory”) in 1929.

Even in its earliest days, the department recognized the particular needs of cities to deal effectively with their public water supply and distribution systems, as well as with their sewage collection, treatment, and disposal systems. However, in 1890, it was decided that these subjects could be more effectively dealt with in a separate “Department of Municipal and Sanitary Engineering,” which, it was hoped, would attract more students and serve better the needs of society in these areas. Later in 1926, it was decided that this was not a good idea. The new department was then discontinued, and its responsibilities were returned to the Department of Civil Engineering, at which time a Sanitary Engineering laboratory was established. With this action, the foundation of the department as we now know it was firmly established.

But the Department of Municipal and Sanitary Engineering, however brief its life, had a greater impact on the development of our department than may be apparent from this brief notice. The head of that department was Arthur Newell Talbot, who served also as head of the Department of Theoretical and Applied Mechanics (TAM), and whose name is now enshrined on the building that houses that department. Talbot was an extraordinary man in many ways. Even as an undergraduate student in CE, from which he received his degree, he demonstrated clearly not only his innate in-

tellectual abilities (an average grade on all undergraduate work of 98 percent), but also the extraordinary breadth of his interests. While performing with distinction in technical areas, he also took leadership roles in literary society activities on campus, holding several offices in the Philomathean organization, as a delegate to the Interstate Oratorical Association, and as an associate engineering editor for *The Illini*.

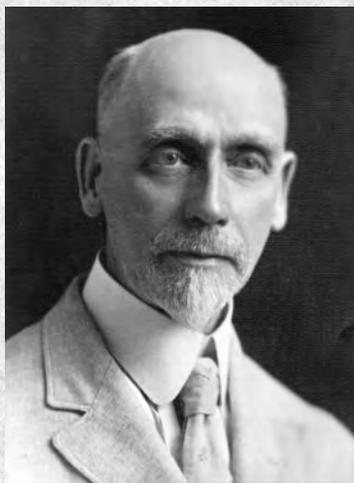
The commonality of interest and the very close relationships that were developed in those early years between the TAM and CEE departments contributed enormously to the successes that our department has enjoyed over the years.

Interesting insight into the early development of the department might be gained by looking briefly at the backgrounds and unique qualifications of the men who contributed most significantly to that development. Looking first at the heads of the department, it is noted that, of these early department heads, only one, Professor Ira O. Baker, held the position for a sustained period of time and left an indelible mark on the department. The others did contribute to the department’s growth, but not nearly to the extent that Baker did.

From the available records, it appears that Professor **Samuel W. Shattuck**, a native of Massachusetts with BS, AM and CE degrees from Norwich University in Vermont who served as the first professor of civil engineering, was a veteran of the Civil War and a man of outstanding managerial and leadership abilities. His appointment in engineering was effective in 1869; however, because of other responsibilities that were given to Shattuck shortly thereafter, direction of the civil engineering program from March 1870 until November 1871 was assigned to Professor Stillman W. Robinson, head of the Department of Mechanical Science and Engineering. Interestingly, Robinson, though not a member of the



John B. Webb



Frederick H. Newell



Clement C. Williams

CE faculty, was well qualified to direct its program, since he had received a civil engineering degree from the University of Michigan in 1863, and had taught mining engineering and geodesy there for several years. Following his service to Civil Engineering, Shattuck was appointed to successively higher positions of leadership within the University, including those of Vice-Regent, Business Agent and Manager, and Comptroller.

John B. Webb, who followed Shattuck and Robinson as a leader of the civil engineering program, was born in Philadelphia and received his CE degree from the University of Michigan in 1871. He had a somewhat longer tenure in the position (1871-78), and he is remembered primarily for his insistence that his students perform at very high standards. Indeed, according to available records, he was regarded as a superb teacher, but also as one whose demands upon the students were excessive and unreasonable. However, in later years, many of his former students are reported to have admitted that his teaching style was more effective than they had realized at the time. In 1878, he took a leave of absence from the University to go abroad, but resigned before returning.

Frederick H. Newell, the fourth head of the department, came to Illinois to fill that position in 1915. He, too, was a native of Pennsylvania (Bradford), but his academic degree was in mining engineering from MIT. He had no academic administrative or teaching experience at that time, his prior work having been with the U. S.

Geological Survey and the U. S. Reclamation Service, through which he had become highly regarded and admired by his fellow professionals. Indicative of his professional status was his appointment as the first director of the U.S. Bureau of Reclamation. A further indication of his reputation is given in the following statement that was written of him by President Theodore Roosevelt:

"He is a public servant of whom it is the bald and literal truth to say, that by his services he has made all good American citizens his debtors."

However, in 1920, Newell observed that he could not get interested in the "educative process," and resigned his position at the U of I to engage in consulting work in Washington, D.C.

Ira Osborn Baker, the third and fifth head of the department, is the individual who influenced most strongly the early development of the department, having led the department for the periods 1878-1915 and 1920-1922, for a total of 39 years. He received his BS and CE degrees from the U of I in 1874 and 1878, respectively, and was appointed Assistant Professor in Charge of Civil Engineering in 1879. He was promoted to Professor in Charge of the Department in 1880.

Baker was a man of extraordinary capabilities and energy. During his tenure as Department Head, he taught courses in engineering drawing, surveying, railroad engineering, bridges, masonry construction, geodesy, descriptive and practical astronomy, tunneling, contracts and specifications, roads and pavements, and analytical mechanics. In the absence of adequate textbooks for his students' use, he prepared such texts for surveying, masonry construction, and roads and pavements, and published them in blueprint form. As noted earlier, he also established cement testing and road materials laboratories to improve both the instructional and research programs of the department. He was also unusually active in professional organizations, having conceived and founded both "The Western Society of Engineers" and "The Society for the Promotion of Engineering Education," the second of which evolved into "The American Society for Engineering Education," which is the primary engineering education organization of today.

In recognition of his outstanding con-

tributions to it, the University of Illinois awarded him the honorary degree of Doctor of Engineering in 1903. Baker retired from the University in 1922 after 48 years of service, 39 of which were as Head of the Department of Civil Engineering.

Clement Clarence Williams, the sixth head of the department, was a native Illinoisan with a CE degree from the University of Colorado. He came to Illinois in 1922, following service on the faculties of the University of Colorado and the University of Kansas. He resigned from the Illinois faculty in 1926 to assume positions of higher responsibility at other institutions, culminating in the Presidency of Lehigh University.

In addition to these department heads, there were many other men who began their



Ira O. Baker

careers on our faculty during these early years, but who made their most significant contributions to the growth of the department in later years. This list includes such giants as Harold E. Babbitt, John S. Crandell, Hardy Cross, James J. Doland, Charles A. Ellis, Whitney C. Huntington, William H. Rayner, Thomas C. Shedd, Carroll C. Wiley, Jamison Vawter, Wilbur M. Wilson, and numerous others, whose contributions to both the department and the profession will be acknowledged in subsequent issues of this newsletter. ☞

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