The University of Michigan

COLLEGE OF ENGINEERING

A Photographic History
Celebrating 150 Years
Anne Duderstadt

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Anne Duderstadt

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The University of Michigan
Ann Arbor, Michigan 48109

To all of those who worked so hard in years past to build one of the world's great engineering colleges, serving Michigan, the nation, and the world today and for generations to come.

PREFACE

In 2004 the College of Engineering will celebrate 150 years of engineering education at the University of Michigan. This is a story of the evolution of the Engineering campus over the years. Of course, universities are profoundly human endeavors. Great achievements, such as those characterizing Michigan's College of Engineering, happen because talented and dedicated faculty, students, staff, alumni and friends make them happen.

Although this essay is focused on the campus of the College of Engineering, it also attempts to introduce the people and events that have contributed so much to the College's history. It is a patchwork, stitching together images with the words of those members of the Michigan family who participated directly in the building of the College and the University. This effort draws not only on the historical archives of the Bentley Historical Library, University publications such as the *Michigan Technic*, the *Michigan Alumnus*, and *The University of Michigan: An Encyclopedic Survey*, but also on the vast writings, personal papers and photographs of two Engineering Deans, Mortimer Cooley and James Duderstadt. A more complete description of resource materials and acknowledgement of assistance is provided in an appendix.

The history of public higher education in America is both rich and significant, particularly for leading universities such as the University of Michigan and for distinguished academic programs such as its College of Engineering. Yet all too often, public universities tend to ignore their history, each generation of faculty, students, and administrators paving over or obliterating the artifacts and achievements of earlier students and faculty with a new layer of structures, programs, and practices. Beyond the importance of preserving such history for future generations, it is also the case that to ignore the past is to condemn one to repeat its mistakes in the future.

This photographic history was created both to document and honor the remarkable achievements of the College of Engineering during its century-and-a-half of leadership in engineering education and, perhaps as well, to provide a resource to guide those who will determine and benefit from its activities in the future.

Ann Arbor, Michigan
Fall 2003

THE EVOLUTION OF THE UNIVERSITY OF MICHIGAN ENGINEERING BUILDINGS

1854

1882

1883

1885

1887

1891

1904

1908

1916

1922

2003

1923

1947

EARLY ENGINEERING EDUCATION

The discipline of engineering evolved during the 18th and 19th centuries from a military craft associated with the technology of war to broader civilian applications such as bridge construction, industrial technology, and transportation.

The first American school to offer instruction in engineering was the United States Military Academy at West Point in 1802 ("military engineering"), followed by the Rensselear Polytechnic Institute in 1824 ("civil engineering"), the United States Naval Academy at Annapolis in 1845, Harvard in 1847 (later spun off as M.I.T.), Dartmouth in 1850, and Yale in 1852.

Although the origin of the University of Michigan's engineering program is generally dated as 1854 when the first classes in this subject were taught, the original plan for the university in 1817 called for a professorship in military science (then known as engineering). Later when the charter for the University was adopted by the new State of Michigan in 1837, it provided for a professorship in "civil engineering and drawing". However the state legislature did not provide adequate funding for this program, and instruction in science and engineering lay dormant until the arrival of Henry Philip Tappan in 1852.

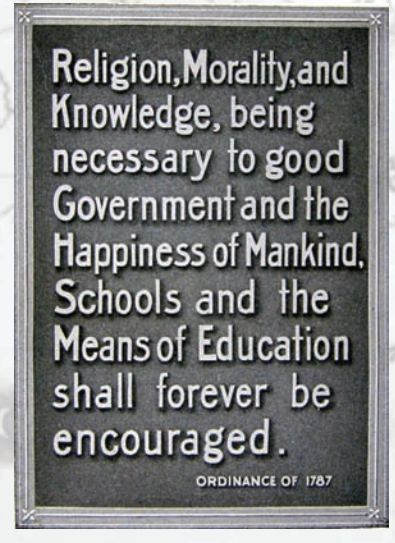
Thomas Jefferson's original sketch map of his plan to divide the Northwest Territory into states. The plan was largely followed when the actual division of land took place.

THE CATHOLEPISTEMIAD or UNIVERSITY OF MICHIGANIA
Established in Detroit, August 26, 1817

Prior to entering the Union as a state in 1837, Michigan was a part of the Northwest Territory. This vast region, containing what we know today as the Midwestern United States, was organized under the Northwest Ordinance of 1787. The Territory of Michigan was organized in 1805, with its chief settlement being the village of Detroit.

The Northwest Ordinance also established the principle of public support of education with its statement: "Religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged."

1787



On August 26, 1817 the Territorial Congress passed an act to establish an educational institution named "the Cathole
pistemiad or University of Michigania", to be located in Detroit.

This act envisioned the organization of a complete and comprehensive educational system with instruction for young people in a continuous program at the elementary, secondary, and university level.

1817

The 1817 act established the University of Michigan as a legal entity comprised of thirteen professors or "didactors", who, along with a president, would govern the concerns of the institution. Furthermore, this body was to function as a Territorial Board of Education with power to establish and supervise "colleges, academies, schools, libraries, museums, athenaeums, botanical gardens, laboratories, and other useful literary and scientific institutions, and to appoint officers, instructors and instructrices in, among, and throughout the various counties, cities, towns, townships, and other geographical divisions of Michigan". (*Michigan Alumnus*, 1928, p. 29)

1817

Four men played a prominent role in the founding of the Catholepistemiad:

William Woodbridge was appointed secretary of the Michigan Territory in 1814. He served as Michigan's second Governor from 1840 until 1841 when he was elected to the United States Senate, where he served until 1847.

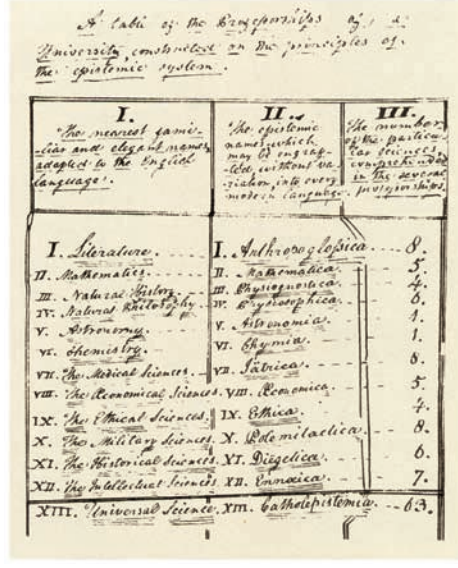
Judge Augustus B. Woodward was appointed to the Territorial Government of Michigan by his friend, Thomas Jefferson. He was put in charge of drafting the laws governing education in the Territory.

Gabriel Richard, a Sulpician missionary priest and a refugee of the French Revolution, settled in Detroit in 1798. He served not only as pastor of Saint Anne's Church but also as schoolmaster for the little community of about 700. By 1808 Father Richard had eight schools operating in the area. He served as Vice-President of the Catholepistemiad.

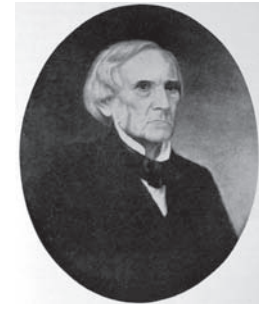
John Monteith, a Scottish Presbyterian minister who graduated from the new Princeton Seminary in 1816, came to Detroit to set up the first Protestant Society in Michigan. He served as President of the Catholepistemiad.

Judge Woodward was heavily influenced by the French system of education, in which all of education, from primary school through college, would be controlled and funded by the state. At the head of this system would be a university, or, as Woodward named it, a "Catholepistemiad", his term for universal science. Woodward organized the knowledge to be taught by the university into thirteen divisions:

Anthropoglofsica or Literature
Mathematica or Mathematics
Physiognostica or Natural History
Physiosoptica or Natural Philosophy
Astronomia or Astronomy
Chymia or Chemistry
Jatrica or The Medical Sciences
Economica or The Economical Sciences
Ethica or The Ethical Sciences
Polemitactica or The Military Sciences
Diegetica or The Historical Sciences
Ennseica or The Intellectual Sciences
including Psychology and Religion
Catholepistemia or Universal Science

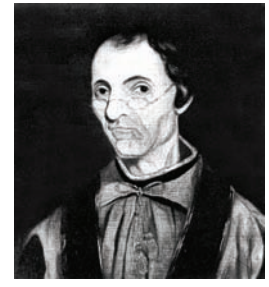


Thirteen Professorships
in Judge Woodward's handwriting



William Woodbridge

Augustus Woodward
(A drawing made from
verbal description)



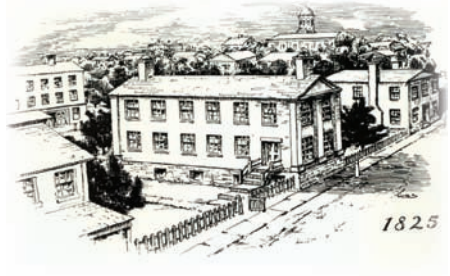
Gabriel Richard

John Monteith
(Later in life)

An official seal was adopted on September 12, 1817.

1817

Less than a month after the Territorial Congress passed Woodward's act, the cornerstone was laid for the first building of the new institution. A two-story building was begun in the fall of 1817. By August of 1818 the lower story was finished, and Lemuel Shattuck opened a Primary School. The second story, which was to house the library and the Classical Academy, was not completed until 1819. (Bidlack, p.16)



The University Building in Detroit

1821

In 1821 the name was changed to the University of Michigan. A Board of Trustees was appointed to govern the school, instead of the Professors as provided in the original act.

1823

In 1823 Congress permitted Michigan to elect a slate of eighteen men from which the President would select nine to serve as a Legislative Council and relieve the governor and judges of law making.

1826

This Legislative Council stepped into the education picture in 1826 by authorizing all townships containing fifty or more families to employ a schoolmaster for six months each year. At the same time the Board of Trustees gave up supervision of primary schools, and the unity of education envisioned by Woodward was lost.

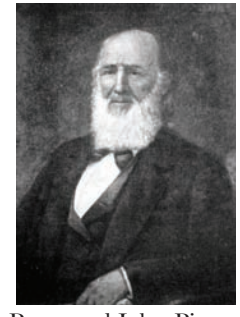
1827

In 1827 the University's presence in Detroit, which was still little more than an elementary school, disappeared.

1837

In the early 1830s the Michigan Territory was in political turmoil in the effort to form a state, develop a constitution, and seek admittance to the Union.

On January 26, 1837, Michigan was admitted to the Union as its twenty-sixth state. That year, the superintendent of public instruction, John Pierce, presented a comprehensive plan for public education for the new state. Primary schools were placed directly under the state superintendent's office. Secondary education was to be provided through county branches of the University, each having its own board of trustees.



Reverend John Pierce

Higher education was to be provided by the University. Three departments were to be established: literature, science and the arts; medicine; and law. The plan was approved on March 18, 1837 in the Organic Act of the University of Michigan. While less ambitious than Judge Woodward's scheme, the Act, in addition to the usual classical curriculum, made provision for professorships in Chemistry, Geology, Botany, Fine Arts, Civil Engineering, and Architecture as they might be needed.

On March 18, 1837 the Ann Arbor Land Company offered 40 acres for the site for the University. On March 20 the offer was accepted by the legislature.

The town of Ann Arbor had existed for only 13 years and had a population of about 2000. The village had a courthouse, a jail, four churches, two newspapers, two banks, eight mills and factories, several stores, eleven lawyers, and nine physicians.

The new Board of Regents met for three days in June and agreed to establish four professorships. The main business was the selection of the site for the campus. There were two choices: a flat tract east of State Street and a site in the hills to the north overlooking the Huron River. They chose the flat area, part of the Rumsey-Noland farm, which had been cleared of forest trees. Part of the farm was a wheat field, part a peach orchard and the rest pasture.

"To those of us who look back now with the advantage of 'hind site', the mistakes of the first board are obvious. Two tracts of land were considered as possible sites for the University. The choice fell on the wrong one, and we now have the present Campus, undistinguished by any natural advantage, instead of the commanding location on the hills overlooking the Huron. The vote was 6 to 5." Wilfred Shaw (*Michigan Alumnus*, January, 1921, p. 223)

View of the Campus from the Northeast

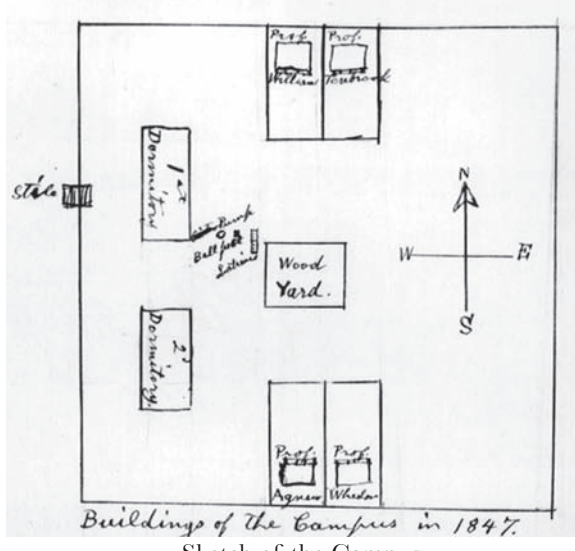
A modest building plan was approved that called for the construction of six buildings, two to serve as dormitories and classrooms and four as professors' houses.

Four identical Professors' Houses were completed in March of 1840. Two were located on North University and two on South University. The two-story plan included a central hall with two rooms opening off each side. The same arrangement was repeated on the second floor. Each room had a fireplace. The houses had low-pitched tin roofs. Wood houses, cisterns, and barns were provided for each.

The houses were also to be used for the storage of the cabinet of natural history specimens, the library, the philosophical apparatus, and other general purposes of the University until the main buildings could be finished.

Professors' House facing the center of Campus

1840



Sketch of the Campus
from a student letter written in 1847

Professors' Houses on South University
from the Jasper Cropsey Painting 1855

The University Building

1841

In September of 1841, the University opened its doors to a class of seven students. The first building on the new Ann Arbor campus, known initially as the University Building, was completed in the summer of 1841. The four-story structure was stucco over brick. Builders are said to have mixed the stucco with skim milk in the hope that this would be more durable.

The student quarters consisted of three-room suites or apartments, each with two bedrooms and a common study room with a fireplace. The building was divided into two sections, each a complete and separate unit consisting of sixteen apartments opening on a central stairway. A tutor, who occupied an apartment on the first floor, presided over each of the sections. The first and second floor also included a chapel and a recitation room. The library was on the third floor and a museum on the fourth.

In 1843 the University Building was named Mason Hall after Michigan's first governor, Steven Mason.

The students paid $7.50 a term for their room, $2.50 for incidentals, and $1.25 to $1.50 for firewood, which they had to split in the wood yard and carry to their room. They collected water from a pump for washing and furnished their own candles. The bedrooms were furnished with a bed, chest, and closet. The study room contained study tables, two chairs, a stove, and a wood closet. (Peckham, p. 24)

The Student Schedule:

5:00 am Awaken by the clanging bell
5:30 am Compulsory chapel in fall and spring
(6:30 am in winter)
6:00 am First recitation class
Breakfast at their private boarding houses
(Weekly board bill $1.50 - $2.00)
Second class after breakfast
Dinner
Studying in library after dinner
Afternoon class
Late pm Second chapel
Supper and freedom until 9:00 pm
No one could leave campus after 9:00 pm

Steven T. Mason

Mason Hall and South College

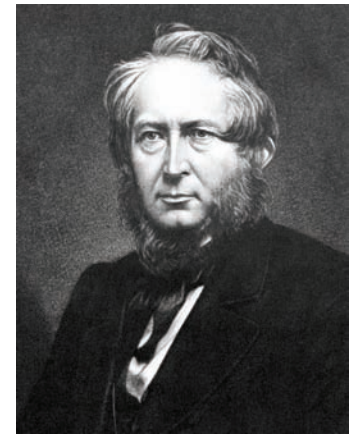
1848

By 1847 enrollments had grown to 89, and a new building was needed for additional recitation rooms, student housing, and for a chemical and medical laboratory. This second building was designed to be identical to Mason Hall. It was completed in 1848-49 and named South College.

Mason Hall and South College were designed originally as dormitories to support instruction by the tutorial system. However the more immediate need for classroom space reduced the dormitory function to three-quarters of each building. The remaining space was devoted to lecture and recitation rooms, a chapel, a library, space for the mineralogical collection, and two literary societies.

From 1841 to 1852 a faculty committee governed the University. The new state constitution of 1850 established two important changes. First was the popular election of the Board of Regents, one from each of the judicial districts, which then numbered eight. The Board was separated from the superintendent of public instruction and the legislature.

The new state constitution also provided the University with autonomy by defining the Board of Regents as a coordinate branch of state government, as firmly founded as the legislature, the governor, or the judiciary, and equal in its power over its designated field of state endeavor.



Henry Philip Tappan

In his inaugural address in December of 1852, Tappan stated:

"We propose to establish a scientific course parallel to the classical course. In this scientific course a more extended study of the Mathematics will be substituted for the Greek and Latin. There will be comprised in it, besides other branches, Civil Engineering, Astronomy with the use of an Observatory, and the application of Chemistry and other Sciences to Agriculture and the industrial arts, generally." (Tappan, p. 40)

1852

The constitution also required the Regents to appoint a president to preside over its meetings and lead the University.

Henry Philip Tappan, a well-known professor of philosophy from New York University was selected as President. He was eager to create "an American University deserving of the name," which would be a part of a public-school system. During his tenure graduate studies were begun, scientific courses were added to the Literary Department, the Law Department was added, and enrollment tripled. Space to accommodate this rapidly growing institution was obtained by eliminating dormitory quarters in the college buildings and converting them to classroom use.

"President Tappan was over six feet tall, stood very erect, walked with a rather long stride, swinging his cane, wore a soft hat with fairly broad brim and was invariably accompanied by a yellowish dun colored dog." Dr. John P. Stoddard, 1859, (*Michigan Alumnus*, 1928-29, p. 366)

President Tappan and his dog Leo

Under the organic act of 1837, provision was made in the Department of Literature, Science and the Arts for a professorship of civil engineering and architecture. This professorship was not filled until 1853. The financial condition of the University was the main reason for the delay in establishing the professorship.

Tappan was one of the first American educators to recognize the value of technological studies. It was under his leadership that engineering education began at the University of Michigan.

The first "scientific course" was described in the catalog of 1852-53, while the first engineering curriculum appears in the catalog of 1855-56. The studies pursued for the first two years of the four year engineering curriculum were identical with those of the corresponding course for the degree of Bachelor of Science.

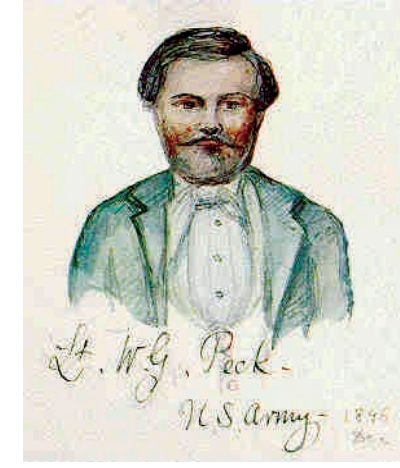
The University of Michigan
by Jasper Cropsey - 1855

For many years the campus remained in this pastoral setting. Wheat was grown on the unoccupied land and the professors' families gathered peaches from the old orchard.

Alexander Winchell

South College

The first engineering classes were held in several rooms in South College.



William Guy Peck
drawing by James W. Abert, 1845

1853

Alexander Winchell was the first faculty member to teach an engineering course at Michigan. Winchell was appointed professor of physics and civil engineering by the Regents in 1853, upon the recommendation of a faculty member, Erastus O. Haven. However, when Winchell arrived in January, 1854 to begin teaching, it soon became apparent that he was a misfit. His own training had not been in engineering and his first "engineering course" at Michigan was, in reality, simply an introduction to English composition for engineering students. (Professors at this time frequently designated their courses by an abbreviation of the name of the text used. Since Winchell used a textbook, "Aids to English Composition" by Parker, his first course was entitled "Parker's Aids".)

Although Winchell also taught several classes on surveying, he had written in his diary on December 1, 1853, "As to civil engineering, I shall have little to do with it at present as the study has not yet been initiated." Winchell was soon involved in disputes both with the chair of Natural Sciences, Silas Douglas, and with President Tappan. After a year, Tappan concluded that Haven had led him astray and that Winchell was not qualified to teach civil engineering. Although several of the Regents wanted to fire him, Tappan found him a position in natural history (zoology, geology, and botany). Winchell continued to be hostile towards Tappan, and he eventually played a role in conspiring with Haven and the Regents to undermine Tappan's presidency.

Alexander Winchell was succeeded by William Guy Peck (Brevet 2nd Lt. of Topographical Engineers, U.S.M.A.). After graduating from the United States Military Academy in 1844 at the head of his class, William Peck was assigned to the topographical engineers. He mapped the Territory of New Mexico in the fall of 1846 with James Abert. Peck was assistant professor of natural philosophy at West Point in 1846, and of mathematics from 1847-1855, when he resigned from the army. He was professor of physics and civil engineering in the University of Michigan from 1855-1857. In 1857 he became adjunct professor of mathematics at Columbia, and from 1861 held the chair of mathematics, mechanics, and astronomy.

Henry Tappan was quite an unusual leader for a 19th century university. Unlike most university presidents of this period, Tappan was a broadly educated philosopher in addition to his religious training. He conceived of the university as a capstone of civilization, a repository for the accumulated knowledge of mankind, and the home of scholars dedicated to the expansion of human understanding. Among his many accomplishments as University president was the establishment of the tradition of emphasis on research, graduate education, student autonomy and freedom, and active faculty governance.

Franz Friedrich Ernst Brünnow

Under Tappan, the University continued its investments in the sciences. Although other universities had adapted existing buildings to provide instruction in chemistry, Michigan went further to build a major Chemistry Laboratory, the first such structure in America designed, constructed, and equipped for instruction and research in chemistry.

1854

One of his most important projects was the Detroit Observatory, completed in 1854, which was one of the first major scientific research facilities in America. Some scholars point to this project as marking the birth of the research university in America.

The Detroit Observatory was made possible by the generosity of several citizens of Detroit who responded to Tappan's request for funds. The Observatory was located on four acres of high land outside the city limits and overlooking the Huron River. It was furnished with excellent instruments, among them an astronomical clock and meridian circle, purchased by Tappan in 1853 in Germany.

President Tappan brought Franz Friedrich Ernst Brünnow from the Royal Observatory in Berlin to the University to serve as the first director of the Observatory. Brünnow married the Tappan's daughter, Rebecca "Barbie" in 1857.

The Detroit Observatory

1856

"The chemical laboratory was a small one-story building with tables for about thirty students at one time. There was no water on the campus except wells, and no sewerage. No gas. In the chemical laboratory we used alcohol lamps instead of Bunsen burners for evaporating purposes, and worked only by daylight." W.F. Breaker, 1859*m*, (*Michigan Alumnus*, 1901)

Chemical Laboratory

DeVolson Wood is considered to be the true founder of the engineering curriculum at Michigan. He was born in 1832 on a farm near Smyrna, New York, and was a teacher from the age of seventeen until his death at sixty-five. He taught while he attended Albany Normal School and Rensselaer Polytechnic Institute, undergoing great hardship in order to secure an education.

In 1857 he set out for Chicago where he had heard there was a teaching vacancy in engineering. However, when he ran short of money in Detroit, he left his baggage and walked on to Ann Arbor. He thought that if he had only ten cents he would write his mother to tell her he was all right. In walking up the steps to one of the campus buildings he found a dime. (Mortimer Cooley notes, p. 14)

DeVolson Wood

Military engineering and tactics were included in the University curriculum in 1861. However, because of the Civil War, no professor was available, so Wood also lectured on these subjects.

Wood felt that the lecture system was a comparatively slow one and should be resorted to only when satisfactory textbooks were not available.

Books on engineering were housed in the University Library, and students did most of their reading there. The engineering books were not collected in a separate library until the completion of the New Engineering Building in 1904.

1857

Wood introduced himself to President Tappan. Since Professor Guy Peck was on leave, Wood was asked to substitute for a few days. He rented a room in a boarding house, promising to pay as soon as he was paid. Since Peck did not return, Wood was appointed assistant professor of civil engineering. Thus the first professor thoroughly trained not only in engineering but also in the teaching of engineering became a member of the faculty.

Wood proposed, designed, and essentially taught, single-handedly, a four-year curriculum in civil engineering offered through a department of engineering that was established in 1858 within the Literary Department.

In 1860, Frank L. Krause and William Minto earned the first degrees in civil engineering conferred by the University.

Law Building (left), Mason Hall (center), South College (right)
In 1841 the library was located in the University Building (Mason Hall).
The library moved to the Law Building in 1863.

Surveying Class

The early engineering courses were laid on a foundation of instruction in science and humanities in the Literary College. Instruction in surveying began in the sophomore year, first with classroom exercises based on the primary texts of that time. After two months of classroom exercises, students were then introduced to the practical aspects of surveying through field exercises. Here the goal was not to make students expert surveyors, but rather to teach them the principles involved in surveying.

Each student was required to do every part of the work for himself. He used the axe, chains, carried the flag, used the compass, the transit, and the theodolite, and computed his work from his field notes and made a plate of it. Neatness and accuracy in the reports were required.

After Land Surveying, the class took up geometrical drawing, tinting and shading. The students worked two hours a day on this subject in the drawing room under the supervision of an instructor. No one was allowed to pass who could not construct his thesis correctly and tint and shade it neatly.

Subjects covered in the junior and senior classes included principles of steam engines of various kinds, principles of designing machinery, pattern making, moulding, and shop work. Part of the lecture course consisted of exercises in machine drawing. Wood assigned a problem unfamiliar to the students, asked them to solve it, and to make a working drawing to represent their idea, accompanied by a specification and report.

The senior course in civil engineering began with the theory and practice of the construction of roads and railroads. It included lectures on the construction of engineering instruments, construction equipment, road and railroad design, and construction management.

The Regents approved a study leading to answers to the following questions:

•At what season of the year can our earthen roads be worked most advantageously?
•Ought the same degree of dryness of the earth be required to work the roads as the farmer desires to make his fields mellow and pilourent?
•When are covered or tiled drains preferable to open drains?
•Would one tiled drain along the axis or center of a road ever be preferable to two parallel ones on the outside?
•When can the scraper be used economically in grading a road? When the wheelbarrow? When the cart?
•In grading a hill, is it more economical to cut at once to the depth required and to fill at once to the heights or to do so by partial cuttings and fillings? (Mortimer Cooley notes, p. 22)

These studies were a forerunner of the Department of Engineering Research, established some 60 years later in 1920 to conduct research on engineering topics of interest to the state and its industry.

In 1872 Wood gave a course of 30 lectures to one student in mining engineering; this course pertained to the engineering operations necessary in the process of mining.

DeVolson Wood resigned in 1872 to go to the Stevens Institute of Technology, where he taught until his death in 1897. Upon his departure, engineering instruction was guided by three newly appointed faculty.

Surveying Class of 1875

1863

Henry Philip Tappan

When Henry Tappan accepted the Presidency of the University of Michigan in August of 1852, he saw the possibilities for building a great educational system. Dr. Tappan's ideas and influence, transformed Michigan from a mere college, teaching only the studies of the established college curriculum of his day, into a true university. He set out to lay the foundation of an institution of learning, which would cover the widest range of knowledge, with postgraduate courses, laboratories for scientific investigation, and libraries.

Yet, both his vision and his personality stimulated considerable opposition. Led by the editor of the Detroit Free Press, the state's newspapers were strongly opposed to his goal of building a true "university" in the European sense, but instead believed that a "high school" was the only goal deserving of state support.

Within a few months after arriving on campus Alexander Winchell developed a strong dislike for Tappan, both because of his personal assignments to various academic programs that he detested (civil engineering and mathematics) as well as to Tappan's refusal to countersign an order for a microscope he wanted. Working closely with his friend Erastus Haven, Winchell sent a private communication to the Regents claiming that Tappan had assailed his professional character. He then began to write letters under the anonymous name of "Scholasticus" to the Detroit newspapers criticizing Tappan and his ideas. He also encouraged a resolution at the state Methodist convention questioning the moral conditions at the University. It was clear that by 1857 Tappan had made a profound enemy in Winchell, and that Winchell had a strong ally in Erastus Haven. Both men believed Tappan must go, and Haven was toying with the idea of someday replacing him (as indicated in his letters).

When the new Board of Regents was elected, both men began to work with a Detroit Regent, Levi Bishop, who also started to write hostile anonymous letters concerning Tappan to the Detroit papers. Most of the other Regents were not initially opposed to Tappan, but Bishop soon found a way to drive a wedge between them by being appointed chair of a committee to report on rules and regulations. His report recommended a committee structure that would assume most of the executive functions of the President and the faculty. Tappan fought against this, noting that not only was this committee unconstitutional, but that the "president and the faculty are not mere 'employees' but are, in fact The university". Bishop launched a counterattack, with vicious diatribes against Tappan's "bundle of nonsense". Winchell continued to ingratiate himself with the Regents and lobbied against Tappan.

As the Regents approached the end of their tenure, they quietly moved to replace Tappan. Haven wrote to tell Alexander Winchell that he had been asked whether he would accept the presidency if it were open, and he replied that he would probably accept an offer. He let his Michigan friends know that he was "profoundly interested in educational matters".

On June 25, 1863, the Regents passed a motion to remove Tappan both as president and as Professor of Philosophy. They then unanimously elected Erastus Haven as president. Tappan was offered the opportunity to resign the morning of the motion but refused. The same day Haven wrote a letter to Winchell conveying his "surprise" and pleasure at the action of the board and asking for Winchell's assistance in preparing for the fall. Winchell wrote that "my worst enemy has been displaced and my best friend put in his stead."

Years later, President James Angell was to have the last word on the sordid incident:

"Tappan was the largest figure of a man that ever appeared on the Michigan Campus, and he was stung to death by gnats!"

(*UM Encyclopedic Survey*, pp. 39-53)
(Paul Lingenfelter, The Firing of Henry Philip Tappan)

Erastus Otis Haven

Erastus Otis Haven served as president from 1863 to 1869. Haven returned to a campus and community that was upset over the Regents' removal of President Tappan. Since he had been a professor from 1852-1856, he had many friends in Ann Arbor, and he was able to win their support.

President Haven devoted himself to caring for the material affairs of the University rather than the problems of future development. With the increasing number of students coming to the University, it became essential to increase the facilities.

On April 2, 1868, in a letter to Alexander Winchell, Haven expressed his discontent with his position:

"I started with an unfair sentiment against me and can never secure impartiality. Why should I work all my life to sustain a cause at a dead lift? Nothing whatever would, or should, induce me to remain here but a belief that I can do more for truth and good here than anywhere else.

A man who is breasted difficulties and wearing out his life wants to know that he is working in a good cause, and for what will be a permanent good, and that after he is gone there will not be persevering effort to conceal and pervert what he has done." (*UM Encyclopedic Survey*, p. 57)

Haven resigned in 1869 and accepted the presidency of Northwestern University, remaining there for three years. From 1873 to 1877 he served as Chancellor of Syracuse University. In 1880 he became a Bishop in the Methodist church and went to San Francisco.

Henry Simmons Frieze served as President *pro tempore* of the University from 1869 to 1871. Frieze was persuaded to come to Michigan by his friend, Professor Boise, who had resigned the chair of Greek in Brown University to accept a similar position in the University of Michigan in 1853. Frieze accepted the chair of Latin Language and Literature in 1854 and held it until his death in 1889.

During his short administration two far-reaching actions in American education were taken: the final establishment of organic relations with the high schools of the State and the admission of women.

Henry Simmons Frieze

Henry Frieze's good friend James Angell said of him:

"We owe to him the introduction of the so-called diploma relation of the schools to the university and the provision for musical study. He actively encouraged the development of graduate work. He was ever seeking to elevate the range and to enrich the character of university teaching. No man except President Tappan has done so much to give to the University its present form and spirit. No one was ever more devoted to the interests of this institution or cherished a more abiding hope for its permanent prosperity and usefulness." (*Michigan Alumnus*, January, 1906, p. 164)

THE LITERARY COLLEGE FACULTY OF 1867

(1) George P. Williams, Professor of Natural Philosophy (2) Alexander Winchell, Professor of Geology (3) James C. Watson, Professor of Astronomy (4) DeVolson Wood, Professor of Civil Engineering (5) Edward P. Evans, Professor of Modern Languages (6) Lucius D. Chapin, Professor of Philosophy (7) Edward Olney, Professor of Mathematics (8) James R. Boise, Professor of Greek (9) Martin L. D'Ooge, Acting Professor of Ancient Languages (10) George B. Merriman, Acting Professor of Physics (11) Henry S. Frieze, Professor of Latin (12) Adam K. Spence, Instructor in Greek (13) Charles K. Adams, Professor of History (14) Silas H. Douglas, Professor of Chemistry (15) Stillman W. Robinson, Assistant in Engineering (16) Moses Coit Tyler, Professor of English (17) Alonzo B. Palmer, Professor of Pathology (18) Allen J. Curtis, Assistant Professor of English

EARLY STUDENT LIFE

In the late 1850s Mason Hall and South College were converted into classrooms and labortories, and the students were sent out to find rooms in town. Many found housing in faculty homes.

Alexander Winchell's home
located on the site of Hill Auditorium

David E. Heineman class of 1887
in his room in Professor Winchell's Octagon House
with Winchell's dog "Curley" at his feet

"On Halloween a few indulged in the sport of hanging gates in tree-tops, overturning stretches of wooden sidewalks, and moving horseblocks across the city." Herbert J. Goulding, 1893*e*, (*Michigan Technic*, October, 1941, p. 9)

"Among our athletics were various forms of activity–a foot race from a quarter to a half-mile, baseball, a few rods from the stile,–sawing our own wood and carrying it up stairs. Once we ran all round the Campus fence. Once–and only once–we took a load of hickory wood a farmer had left for sale, at night, in front of the fence, instead of in the wood yard, and carried it–cold winter night–up four pair of stairs, stick by stick, and put it on top of the building. We then took the wagon apart and carried it up also, wheels, axles, tongue, and side stakes, put it together again, and piled the wood upon it, so that in the morning the farmer found his load aloft, not able to get the horses up, nor if he could, to get them down again. The perpetrators were discovered and by noon we had everything down below, as before." Nathaniel West, 1846 (*Michigan Alumnus*, March, 1906, p. 261)

"The annual football rush between the Frosh and Sophs afforded another bit of exercise. This took place in the open area bounded by North University and East University. Male students of each class, numbering about two hundred on a side, were lined up facing north and south with a stated space between them. The coeds were on the sidelines to cheer the members of their respective classes. The Juniors backed up the Freshmen and the Seniors the Sophomores. Their duty was to rush back into the fray any duffer who had wiggled out for a bit of relief from the crushing pressure which had reduced him to half his normal size. It often took hours to decide the contest. Due to the shortage of bed space in University Hospital, this 'sport' had to be abandoned and was replaced by the tug of war. The traditional site for this event was the Huron River." Herbert J. Goulding, 1893*e* (*Michigan Technic*, Oct., 1941, p. 9)

"Behind the bell post were the latrines. As these sometimes got in bad condition, the students adopted the habit of burning them up occasionally o'night, thus compelling the Regents to build fresh ones pretty often. After our graduation I was appointed Supt. Of Grounds & Buildings, and I stopped the burning by constructing new latrines, all of brick, making them incombustible. The Regents however were staggered at the bill, as they cost about $300. (Student Letter, 1847, Bentley)

"Another athletic exercise was turning the University bell's mouth up to the sky in the cold wintertime, at night, filling the bell with water. The clapper was dumb of course at six o'clock in the morning, and we were 'found missing' at prayer." Nathaniel West, 1846 (*Michigan Alumnus*, 1906, p. 261)

Frosh and Sophs Rush

Tug of War across the Huron River

"The students of this period found exercise in dancing, swimming in the Huron River, canoeing and long hikes over the hills surrounding Ann Arbor." Herbert J. Goulding, 1893*e* (*Michigan Technic*, October, 1941, p. 9)

James Burrill Angell

When Angell arrived at Michigan in 1871, the University enrolled 1,110 students taught by 35 faculty. Its annual budget was $76,600.

At the beginning of the Angell administration, the Department of Literature, Science, and the Arts offered six degree programs, each four years in length: classical, scientific, Latin and scientific, Greek and scientific, civil engineering, and mining engineering.

The scientific curriculum was subdivided further into specific four-year majors in general science, chemistry, and biology. Since the first two years of the engineering curriculum was essentially identical to that of the other science majors, the engineering majors also were regarded as subdivisions of the scientific course until 1895 when Engineering became a separate academic unit.

1871

In 1871 James Burrill Angell accepted the Presidency of the University of Michigan.

James Angell prepared for Brown University at a grammar school in Providence where he studied under Henry Frieze. He graduated from Brown, with highest honors, in 1849. He became a student of civil engineering in the office of the city engineer of Boston. He spent this period to such advantage that later he was given the choice of a professorship at Brown either in civil engineering or modern languages. He chose modern languages and remained a professor at Brown for seven years. He served as editor of the Providence Journal during the Civil War from 1860 until 1866 when he accepted the presidency of the University of Vermont.

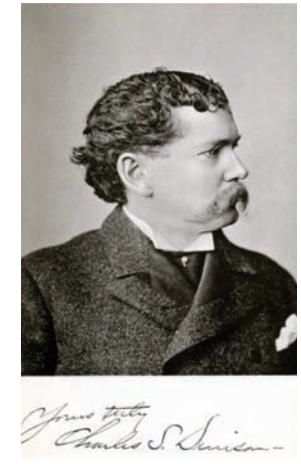
Angell's role in the selection and recruiting of University faculty was one of his great contributions. Over a span of nearly forty years the faculty grew by more than eleven-fold. The number of major appointments increased to the hundreds. Many outstanding scholars and staff were attracted to the University during the Angell years.

Angell faced a major challenge in building the facilities necessary to meet the needs of a rapidly growing university. Yet, even with the meager funds at his disposal, Angell managed to build over 50 buildings (exclusive of the heating plant, the electric light plant, and the campus steam tunnel system). Although these buildings were not palatial nor models of architectural beauty, they were adequate to meet the needs of the rapidly expanding academic programs.

The University of Michigan Campus circa 1870
Medical Building, Chemical Laboratory, Law Building, Mason Hall & South College

Joseph Baker Davis

Charles Ezra Greene



Charles Simeon Denison

1872

Following the resignation of DeVolson Wood in 1872, the University hired three new faculty members in engineering: Joseph Davis, Charles Greene, and Charles Denison. Joseph Davis was appointed Assistant Professor of Civil Engineering in 1872. He had received his degree from Michigan in 1868. When Davis was ready for college he looked about and found that the University of Michigan was one of the least expensive schools to attend. He started for Ann Arbor from New Bedford, where his father was captain of a whaler. He walked most of the way. Upon finishing college, Davis worked as an engineer. In 1871 he went to Pennsylvania, where he organized the Civil Engineering Department at Friends, now Swarthmore College. In 1874, Davis organized the University of Michigan camp for fieldwork in surveying. This was the pioneer surveying camp for fieldwork in the United States. In 1891 he was appointed chair of Geodesy and Surveying, which he held until his retirement. Davis was a successful consulting engineer. He served as City Engineer of Ann Arbor for sixteen years.

In 1872 Charles Green was appointed Professor of Civil Engineering. After graduating from Harvard with a B.A. in 1862, he entered the business of breech-loading rifle manufacture in Massachusetts, and in February of 1864 Greene became clerk of the Quartermaster's Department at Readville, Massachusetts. He was commissioned First Lieutenant in the U.S. Colored Troops and served as regimental quartermaster in Richmond, Virginia and in Texas until 1866, when he resigned. He then entered the Massachusetts Institute of Technology, where he received a B.S. and C.E. in 1868. After graduation he engaged in professional railroad, river, and harbor improvement work in Maine and New Hampshire and was city engineer of Bangor, Maine. He carried on a general practice until 1872, when he was appointed Professor of Civil Engineering at Michigan. Greene surveyed the Ann Arbor Railroad and designed and was superintendent of the construction of the Ann Arbor waterworks in 1885 and the Ann Arbor sewerage system in 1890.

Charles Denison received a B.S. in 1870 and a C.E. in 1871 from the University of Vermont. He was appointed Instructor in Engineering and Drawing in 1872. He was recruited to the faculty by his friend, James Angell, who, the year before, had also come to Michigan from the University of Vermont. The Angells looked upon Denison almost as a member of the family. He was the favored guest at nearly every table in town. He was a connoisseur of food and wine as well as fashion. Denison taught for forty years at the University. He was a bachelor and his students were his whole life. He was known to the students as "Denny" and to his intimates as "Little Lord Chesterfield". He served on the faculty for 42 years. Denison also served as Ann Arbor city engineer.

Silas Hamilton Douglas


William Henry Pettee


Stillman Williams Robinson

METALLURGY

In 1875-76 an appropriation was made for a professor of metallurgy, a professor of mining engineering, and a professor of architecture and design along with the necessary assistant instructors.

Silas Doulgas was named Professor of Metallurgy and Chemical Technology from 1875-77. When the appropriations were not renewed, Douglas continued as Director of the Chemical Laboratory. Douglas came to Ann Arbor in 1843 to practice medicine. In 1844 he began his tenure at the University of Michigan, serving in various roles until his retirement in 1877. He was actively involved in founding the Medical Department and organizing the Chemical Laboratory. Besides his professorial role he had charge of the Observatory, the Medical Building, the Chemical Laboratory, and other University facilities.

MINING ENGINEERING

As early as 1864-65 a course in mining engineering leading to the degree of Mining Engineering was announced, and this degree was conferred from 1867 to 1870. However, no legislative action providing for a school of mines was taken until 1875-76, when an appropriation was made for a professor of mining engineering.

William Henry Pettee (B.A., Harvard, 1861) was appointed Professor of Mining Engineering. Unfortunately the legislature neglected to continue the appropriation at the expiration of the biennial period. Pettee resigned the chair of mining engineering and was appointed Professor of Mineralogy and Economic Geology, in charge of Mining Engineering.

MECHANICAL ENGINEERING

Stillman Williams Robinson (C.E., 1863) was appointed Assistant Professor of Civil Engineering (1866-67) and Assistant Professor of Mining Engineering and Geodesy (1867-70). He offered the first instruction in Mechanical Engineering. He resigned in 1870 to accept the chair of Mechanical Engineering at the Industrial University of Illinois and later was Professor of Mechanical Engineering at Ohio State University.

In 1868 a course was established leading to the degree of Mechanical Engineer, but the degree was discontinued in 1870, until the department was re-established in 1881.

THE FIRST ENGINEERING BUILDING

Mechanical engineering reappeared at Michigan in 1881 with the arrival of a new faculty member, Mortimer Cooley. Cooley had been detailed to Michigan by the U.S. Navy under the 1879 Act of Congress to serve as Professor of Steam Engineering and Iron Shipbuilding. Although he lectured on naval architecture during the 1880s, his real expertise lay in mechanical engineering, and in 1881 his title was renamed Professor of Mechanical Engineering. At the time he was the only mechanical engineer in the state of Michigan.

When Cooley arrived, engineering enrollments had dropped from 69 in 1879 to only 25 students in 1881, because of the national economy. However the following year enrollments rebounded to 60 students and continued to increase in subsequent years.

Scientific Blacksmith Shop

1881

Mortimer Elwyn Cooley

1882

In October of 1881, Professor Frieze, then acting president, sent for Mortimer Cooley, and advised him of the appropriation of $2,500 for an engineering laboratory. The money was to revert to the state if not expended by December. Cooley was asked if he could use this sum to establish a mechanical engineering laboratory. The possibility of shops was mentioned, but the appropriation seemed insufficient. The matter was dropped until November when Cooley was again called before the president and ordered to spend the money. He acquiesced on condition that the building cost no more than $1,500, leaving the balance for equipment.

The first Engineering Shop was twenty-four feet by thirty-six feet, constructed of bricks placed edgewise and nailed to the studding. It was the first fireproof building on campus. Cooley noted:

"It was Charles Kendall Adams who used to say to me daily as he walked by our first little engineering shop, 'And how is the scientific blacksmith shop doing this morning?' Professor Adams formerly had taught Latin, and I always enjoyed the fact that our first shop was built through the urging of one Latin professor (Acting President Frieze) and nicknamed by another, thus giving mechanical engineering a truly classical beginning at Michigan" Mortimer Cooley (*Scientific Blacksmith*, p. 62)

In 1887 the "Scientific Blacksmith Shop" was sold and moved to North University and Observatory for a private residence.

Mortimer Cooley described the first Engineering Building:

"At the west end of this little building was the forge shop, at the east end was the foundry. On the second floor was the pattern shop and machine shop. Stairs to the second floor were in the northwest corner, with a landing part way up. The little vertical four horsepower engine was in the angle of the stairway. The belt was vertical and passed through the floor to the more than thirty feet of shafting and pulleys at the ceiling of the second floor.

The iron lathe was found in the basement of old University Hall and tinkered up for use. I made the wood lathe myself; it had a bed and cone pulleys of wood.

Scientific Blacksmith Shop and Carpenter's Shop

"The first little engineering shop was immediately overcrowded; a year or two later we moved alongside it an old wooden building which had been used as a shop for making museum cases when the old museum was built. It had originally been placed where the old Physics Building now stands. It was to be moved off the campus, and I begged it of the Regents, together with the machinery used for making the museum cases." Mortimer Cooley (*Scientific Blacksmith*, p. 101)

1883

The heating apparatus was an old fashioned regulator stove with a removable top.

A forge was built, and a small cupola erected. The cupola, twenty inches in diameter and five or six feet high, was on the east side of the chimney in the center of the building. Notwithstanding its size it worked well, and many castings in molds fashioned from patterns were made on the floor above." (*Scientific Blacksmith*, p. 104)

Mortimer Cooley knew something about blacksmithing and woodworking but not the operation of a foundry. He hired Bob Winslow who worked at the foundry on Huron Street to teach foundry practice.

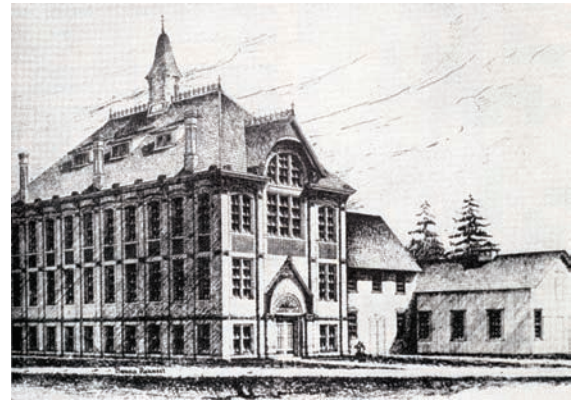
Here it should be noted that the University of Michigan was the first university in the United States to offer true laboratory facilities and to require laboratory courses of its students.

Bob Winslow

Mortimer Cooley (seated) and Bob Winslow in the Woodworking Shop

"I found dear old Bob Winslow at the foundry on Huron Street just west of the Ann Arbor Railroad tracks, and I hired him to teach foundry practice. Foundry men in those days could mold from almost anything as a pattern. If a part from a machine was brought in, Bob used it as a pattern, trimmed up the molds a bit, and reproduced the part in practically its original form". Mortimer Cooley (*Scientific Blacksmith*, p. 105)

By 1885 additional space was needed for Engineering. The first unit of the permanent brick Engineering Shop was built on the east side of the original laboratory (the Scientific Blacksmith Shop) and connected with it by a passage-way at the second-floor level.



Sketch of the new Engineering Shop, beside the Scientific Blacksmith Shop and Carpenter's Shop

The Engineering Shops with the tower and forge (right)

1885

The Engineering Shop
(Here the Carpenter's Shop has been removed, although the Scientific Blacksmith Shop remains.)

Within two years after the completion of the Engineering Shop, an expansion was needed, which necessitated the removal of the Scientific Blacksmith Shop and Carpenter's Shop. The completed building consisted of the original east building, the central part and tower, and a west wing, one-story foundry and forge shop. The new addition contained offices, classrooms, drawing rooms, and laboratory for testing machines, steam engines, water motors, and strength of materials.

1887

Engineering Shops Forge

The early courses in mechanical engineering were concerned largely with the design of machinery and with the technology of the workshop. Shops were the place of the early efforts at practical instruction rather than the laboratory. The early emphasis on shop work was typical of the urge which the schools felt to make their training as practical as possible, as was the tendency of engineering teachers to demonstrate their competency by undertaking collateral practice.

When the University Library was torn down to make way for the New Library, Mortimer Cooley asked for the clock and chimes to be put in the Engineering Shops Building. The clock and chimes rang at 8:00 a.m. and 6:00 p.m. to signify the beginning and end of the study day. When Burton Tower and the Baird Carillon were finished in 1936, the clock and chimes had outlived their usefulness.

The Engineering Shops were used for over forty years. The building had been condemned many times as a "fire trap". In 1937 it was damaged by two fires in the laboratories.

The building was torn down in 1956 when the new automotive laboratory was completed on the North Campus.

The Undergraduate Library was built on the site.

The University Library with clock and chimes

Demolition of the University Library Tower
July, 1917

Engineering Shops with clock and chimes
from the demolished University Library

The bells were taken down from the Engineering Shop's Tower to be used as scrap metal for WWII.

ELECTRICAL ENGINEERING

Special training in physics for engineering and medical students contributed to the need for a Physics Laboratory. The red brick building was completed in 1889 and became the headquarters for work in electrical machinery. The basement ceiling was eleven feet high, finished with special reference to work in electricity. The third floor housed the Hygienic Laboratory.

Professor Henry Smith Carhart assisted by Joseph E. Putnam offered the first course in dynamo electric machinery in physics in 1888-89. The work was done in the basement of the Physics Laboratory with meager equipment.

Henry Smith Carhart

George Washington Patterson

1889

Physics Laboratory

Henry Carhart taught school at age 16. At 19 he was head of a Quaker School, teaching and earning money to complete his preparatory course. He graduated from Wesleyan in 1869. After teaching Latin for two years, he entered Yale Divinity School. However the advantages offered by Yale's Sheffield Scientific School proved too strong an attraction for him to resist. From 1872 until 1886 he was Professor of Physics at Northwestern University. In 1886 he became Professor of Physics at Michigan. He served the University of Michigan for twenty-three years as professor of physics and director of the physical laboratory. He also designed the campus lighting plant and all its electrical details.

In 1889 Professor Carhart thought the time ripe for the introduction of a course in electrical engineering. He was authorized to select an instructor to assist him in his enlarged duties. He chose George Washington Patterson.

George Washington Patterson received his B.A. from Yale in 1884. After spending the next year abroad, he entered M.I.T. and received a B.S. in Electrical Engineering two years later. He remained there as an assistant in Mathematics for one year. In 1888 to appease his father, he entered the Harvard Law School and completed the first year of the course. While in Russia the following summer he was offered the position of Instructor in Physics at Michigan and started teaching in the fall of 1889. Two years later he became Associate Professor of Electrical Engineering. In 1905 Patterson became the first Professor of Electrical Engineering and was head of the Department from 1904 to 1914. He also served as Assistant Dean in 1922, and Acting Dean in 1927-28.

The first Electrical Engineering degree was conferred in 1890. Electrical Engineering became a Department in 1895.

In 1884 a curriculum leading to the degree of B.S. in chemistry was organized in the Department of LS&A. This department was abolished in 1896. In place of this course a new curriculum leading to the degree of B.S. in chemical engineering was organized in 1898 in the Department of Engineering.

Edward Demill Campbell

Edward Campbell was the son of Judge James V. Campbell, a jurist of the Supreme Court for 36 years and one of the three original professors of the Law Department.

Campbell joined the Michigan faculty in 1890 and took charge of a branch of chemical work he had studied as a student eight years before. He lost his eyesight on April 12, 1892, while in the laboratory, conducting a chemical investigation with his students. He was into systematic athletic exercise, especially gymnastics.

1890

The first degree in Chemical Engineering was conferred in 1901. In 1890 Edward Campbell was appointed Professor of Chemical Engineering and Analytical Chemistry, and in 1905 he became Director of the Chemical Laboratory. When the new Chemistry Building was completed in 1909, a large portion of it was devoted to chemical engineering instruction.

The opening up of the fields of electrical and chemical engineering led towards the development of engineering education into a scientific function, with emphasis upon the scientific spirit and original research which have marked the field in later years.

New Chemistry Building
(The Original Chemical Laboratory is inserted at lower right.)

Engineering continued to grow, with 160 students enrolled in 1890 in fields including civil, mining, mechanical, electrical, and sanitary engineering. With growing enrollments, however, came the need for more space.

In 1891 the engineers were given the use of the building vacated by the Dental College when it moved into the former quarters of the hospital on North University. This building had been one of the original Professors' Houses.

A third story was added and the entrance was moved to the west side of the new part and the word "Engineering" was placed over the doorway. There were fifteen classrooms and several offices. The building continued in use until 1922, when it was removed to make room for the Clements Library.

Dental Building on South University
with the addition on the right of the Professors' House

1891

The Engineering Building
A third story was added and the entrance moved to the west side.

The Engineering Building

As early as 1858, the University of Michigan had an opportunity to become the first school to require a five year curriculum for engineering graduates. At a meeting of the Board of Regents held that year, Professor DeVolson Wood summarized the problem of getting the necessary engineering training as well as the essential classical requirements in a four year curriculum. He asked the Academic Faculty to report their views on this matter. "Should the entire engineering course be included, in point of time, within the present undergraduate course of four years, or should a fifth year be added to complete the course?" This matter was not settled at that time, but the problem was raised many times thereafter, and the five-year course was advocated and recommended again by Mortimer Cooley, when he served as dean of the College. (Mortimer Cooley notes, p. 9)

Cooley had long been of the opinion that there should be a six-year course in engineering, two years of which would be devoted to the teaching of cultural subjects.

Charles Greene and Mortimer Cooley were reluctant supporters of the separation of the Department of Engineering from the Department of Literature, Science and the Arts, believing that the engineer's education should be as broad as possible, and that in separation the tendency would be to narrow it.

In April of 1895 the Regents resolved that "A *School of Technology be organized, comprising the Departments of Civil, Mechanical and Electrical Engineering, and that Professor Charles E. Greene be appointed Dean."*

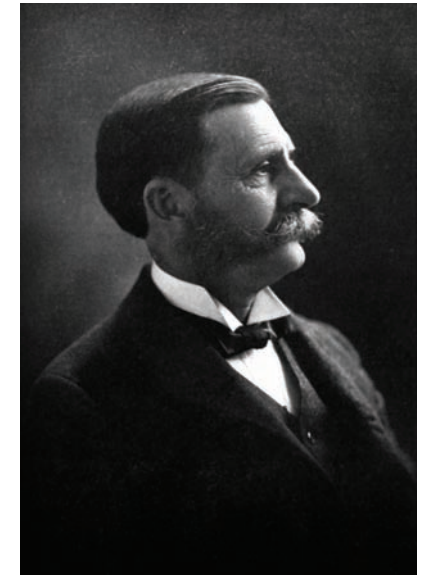
In January, 1915 the University adopted the nomenclature based on standards approved by the Association of American Universities, the National Association of State Universities, and the Carnegie Foundation for the Advancement of Teaching. Those units of the University which admitted students directly from high schools and preparatory schools were designated as "Colleges", while the units which require some collegiate work before admission were labelled "Schools". Consistent with this practice, the Department of Engineering was renamed the College of Engineering in 1915. (*Michigan Alumnus*, 1931-2, p. 287)

1895

In 1871 DeVolson Wood wrote:

"I think we ought to seek for the establishment of a fourth department in the University, to be called the School of Technology, or Industrial School, or School of Arts and Trades, or some other suitable name, within which we should organize advanced courses in General Science, courses in Technical Chemistry, Courses in Engineering and Architecture. To accomplish this requires more means than the University has at its command, and hence an appeal should be made to the citizens of the State to endow such a school, or endow professorships, or erect a building, or to furnish apparatus; and if this does not succeed, an appeal should be made to the State for the same object, trusting that from one or both sources the necessary means might be secured to enable the University to develop such a department as to do credit to itself and meet the demands of the times." (Mortimer Cooley notes, p. 27)

In 1895 Engineering was separated from the Department of Literature, Science and the Arts and became an independent department. For a long time the main divisions of the University were called "Departments", distinguished in later years from their sub-divisions only by the capitalization of the "d".



Charles E. Greene

MARINE ENGINEERING
& NAVAL ARCHITECTURE

The rapid expansion of shipping on the Great Lakes, coupled with the increasingly sophisticated technology characterizing larger and faster ships, created a demand for technically trained designers and engineers in the marine field.

In 1900, the University established a Department of Marine Engineering and Naval Architecture.

Herbert Charles Sadler

In President Angell's report of October 1901 he noted:

"The Engineering Department, which is receiving this year a third more students than it had last year, must have more room at once."

The engineering buildings in 1900 included the Engineering Building and the Engineering Shops. Classes were also held in the Physics Building and the Chemical Laboratory. Engineers took their humanities courses with their fellow students in the Department of Literature, Science and the Arts in University Hall and Tappan Hall.

1900

Although some instruction in naval architecture had been given as early as 1881 (notably by Mortimer Cooley) in courses such as Naval Architecture, Marine Engines, and Ship Building, the new department decided to adopt instead an entirely new curriculum, patterned after that developed by the University of Glasgow, then a leading program in naval architecture. In 1899 the University requested and obtained an appropriation to establish the new program.

In 1900 Herbert Sadler (B.S. Glasgow) was appointed Junior Professor of Naval Architecture, and in 1901 a curriculum was established leading to a degree in Marine Engineering. The department trained students in the design and construction of ships, and of machinery for ships. Training was also offered to those who wished to enter the field of water transportation. The first degree was conferred in 1902.

Herbert Sadler was born in London in 1872. He studied at the University of Glasgow. In the summer of 1890 he became an apprentice in the firm of A. & J. Inglis, Engineers and Shipbuilders. After graduation he completed his apprenticeship in their drafting shop. He was employed in that capacity until 1896, when he was appointed Assistant Professor of Naval Architecture at Glasgow University.

In the fall of 1900, when the University of Michigan inaugurated a regular course in Naval Architecture and Engineering, Sadler was chosen to take charge of this new department.

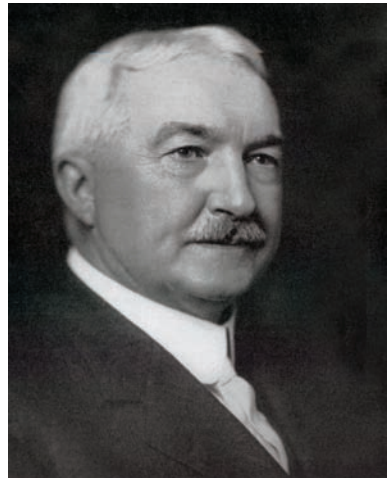
Professor Sadler supervised the design and construction of the Naval Tank in the New Engineering Building. He also designed many famous Great Lakes vessels and numerous ferry boats. He had a great interest in yachting, and he designed a number of pleasure craft as well as motor boats.

On October 16, 1903 Dean Charles Greene died.

Charles C. Brown said in a memorial to Charles Greene:

"The great works shall pass away. Even so enduring monuments as the pyramids are passing away. No one, however, can say that the work of such a man as this devoted teacher has an end. Into the lives of those he has taught have been built motives, influences, in a word, character, that will go on. The men they have helped to make shall go on doing their part in the making of other men, and reach through these channels to distant generations. So has this man built, not in steel, nor stone, but in human lives." (*Michigan Alumnus*, July, 1905)

DEAN MORTIMER COOLEY



Mortimer Cooley

Cooley was exceptionally active both within and external to the University. He was long the Grand Marshall for University commencements. He served the city of Ann Arbor in many ways, first as a member of the Board of Fire Commissioners (1890), then as President of the City Council in 1891 and 1892 (an elected office), and as Mayor of Ann Arbor in 1920. In 1924 he ran as the Democratic candidate for the United States Senate, opposing the incumbent James Couzens.

"Cooley was also a favorite of students and alumni. Alumni would return to his office each year to be greeted by a genial smile, a cigar, and a chat in one of those easy chairs which, with pictures, part of his famous Oriental rug collection, and the souvenirs of his travels, made the Dean's large paneled office a place of beauty." (*Michigan Technic*, March, 1935)

Dean Mortimer Cooley's Office in the New Engineering Building

1903

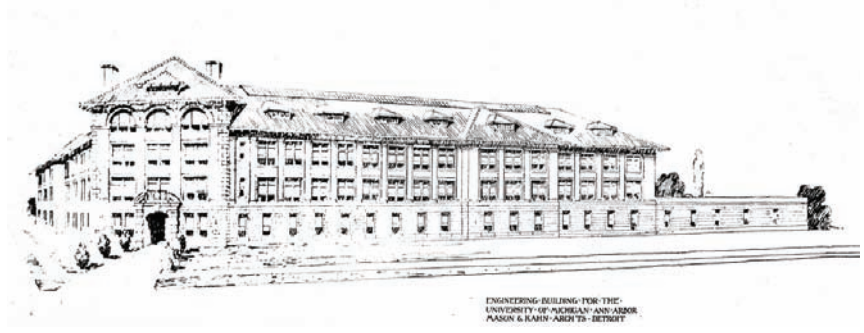
Mortimer Cooley succeeded Charles Greene as Dean of Engineering in 1903. Cooley was the key player in the rapid progress of the College of Engineering during the early decades of the 20th Century. During Cooley's tenure at Michigan both as a faculty member and then dean, enrollments in the College grew from less than 30 to more than 2000, the faculty from three instructors teaching several courses to more than 160 professors and staff teaching hundreds of courses, and a temporary shop of 1,720 square feet to over 500,000 square feet of well equipped buildings.

Dean Mortimer Cooley - Commencement Marshall Governor Osborne (left), President Hutchins (center), and Mortimer Cooley (in academic gown)

In 1895 as the need for additional facilities became apparent in the face of expanding enrollments, Charles Greene, the Dean of the Department, was asked to draw up plans for a new building. He suggested a small U-shaped structure, costing about $50,000. However, before his plans could be acted upon, he died and was succeeded by Mortimer Cooley. Merely as a matter of form, Cooley was asked his stand on the building program. He replied:

"Gentlemen, if you could but see the other engineering colleges with which we are forced to compete, you would not hesitate for one moment to appropriate a quarter of a million dollars."

They did. The New Engineering Building was the result. (*Michigan Technic*, December, 1929)



Architectural Drawing of the New Engineering Building

The New Engineering Building

1904

In 1902 construction began on the four-storied structure known for years as the New Engineering Building and later renamed West Engineering. The building was completed in 1903 and opened for classes in the fall of 1904.

The New Engineering Building was planned for 600 students. By the time the building opened there were 828 students, and the new facility was almost immediately overcrowded.

In 1910 the Building was extended one hundred feet over the Naval Tank, as was provided in the original plans. The Naval Tank, built in the New Engineering Building in 1904, was the only one in this country, with the exception of the government's tank in Washington, D.C. Equipment was available for studies relating to ship resistance, shallow-water effect, streamline flow, wave profiles, wake, and rolling, as well as a model room and workshop for making models of vessels.

The Naval Towing Tank

CHARLES DENISON &
ENGINEERING DRAWING

New Engineering Building Courtyard

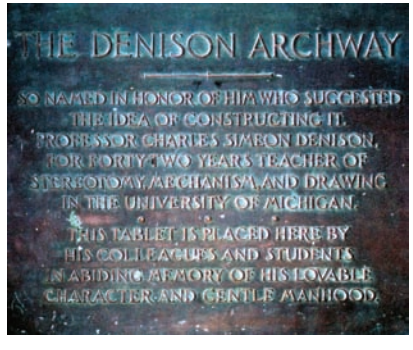
Charles Simeon Denison

Mortimer Cooley also commented fondly on Charles Denison:

"Charles Denison's nickname was 'Little Lord Chesterfield,' for he was the Beau Brummel of the University. His slightly curly hair matched the shine on his boots. His ties matched his socks. His wardrobe contained unnumbered suits of clothes and overcoats for all kinds of weather. The collars of some of his topcoats were of expensive fur. He had all kinds of haberdashery, including more than forty shirts. He did not have these laundered in Ann Arbor, but sent them each month to Chicago for 'proper' laundering." (*Scientific Blacksmith*, p. 96)

1904

The famous "Engineering Arch" in the New Engineering Building was the contribution of another engineering professor, Charles Denison. When he learned that there was a serious problem of how to design the building without interfering with the diagonal walk of the campus, he prepared a sketch showing the diagonal walk passing through an archway in the building.



The Arch was named "The Denison Archway" later, known as the "Engineering Arch".

Professor Denison was loved and respected by both students and faculty. President Angell said of his good friend at the time of his death:

"He was a good man, and he came of a long line of good men. The family traces its lineage from Antenor, King of the Cimbri, of the Trojan nobility, born about 1239 B.C., down through Charlemagne and a royal line to Captain George Denison of Stonington, Connecticut, who came to America in 1631, and who achieved distinction for services rendered in Cromwell's army and in our own Indian wars." (*Michigan Technic*, May, 1914)

At the close of Denison's first year at Michigan he was engaged with Rollin J. Reeves to survey the boundary line between the territories of Idaho and Washington from the Snake River north to the national boundary. This proved to be a very hazardous undertaking and nearly cost the entire party their lives.

Charles Denison's Classrooms

Professor Denison, "Denny" to his students, *"would go around the free-hand drawing room inspecting the drawings. He would stop at a desk, look the work over, and say in a voice to be heard by all, 'Very good, very good.' He would then take the student's pencil and begin changing a line here and there, calling out the changes as they were made, until the drawing had taken on an entirely new and correct form."* Herbert J. Goulding, 1893*e* (*Michigan Technic*, Nov., 1941, p. 10)

SURVEYING

Surveying constituted a large part of the early engineering curriculum at Michigan and had been taught continuously from the beginning. The Department of Geodesy and Surveying became a formal academic unit offering a degree in 1921, and the first degree was conferred in 1923. The department, like that of civil engineering, was under the supervision of Winchell, Peck, Wood, and Greene. Upon Greene's death, Joseph Baker Davis was put in charge.

As early as 1874, as an instructor, Davis had organized a camp for field work in surveying. This was the first surveying camp for field work in the nation. It was organized at Whitmore Lake when it was a four-week course. The camp was later moved from place to place each year.

In the summer of 1908, through the efforts of Professor Davis and in part by a gift from Colonel and Mrs. Charles Bogardus of Pellston, the University acquired 1500 acres of land on Douglas Lake, thus giving the camp a permanent home. It was named Camp Davis.

Since 1912 a weekly paper, *"Camp Davis Black Fly"* has been published.

Camp Davis letterhead bears the following legend:

"A camp for surveying. The first of its kind. Established in 1874."

1879 Surveying Class

Camp Davis
Douglas Lake, Pellston, Michigan

A boat on Douglas Lake at Camp Davis

Women at Camp Davis - 1915

Camp Davis cooks

Professor and Mrs. Davis

A visit to one of the early camps would have found an enthusiastic group of students working under the direction of Professor Davis. He was father of the Camp. Mrs. Davis was generally present. She was the nurse and the mother of the early camps.

Joseph Davis
Advice to Engineers
"Young man, if ever any question arises as between the use of theory and your horse sense, trust your horse sense."

In 1915 a concrete and steel kitchen and complete sanitary system were provided. Electric lighting was installed, and the tents were replaced by steel buildings. Much of the labor was done by the students and teaching staff.

In February, 1929, the University acquired a new site located at Jackson Hole, Wyoming, 75 miles south of Yellowstone Park. The camp had permanent buildings, including residences, dining room, kitchen, keeper's residence, instrument room, shop, and garage. The course was for eight weeks of five and one-half days each week and provided eight hours of credit in surveying. The cost to each student was about $150 for the summer, including tuition, board, and transportation.

Camp Davis
Jackson Hole, Wyoming

Over the years the Department of Surveying was housed in a variety of locations on campus. It had always had temporary quarters. When the New Engineering Building was completed, the department was moved there. The building, planned for 600 students, had become so crowded that by 1908 the Department of Surveying could no longer be housed there.

The department finally got its own facility, all be it, a hand-me-down building. In 1875 a temporary building to be used as a hospital was constructed at the back of the east Professors' House on North University. It was called the Pavilion Hospital. It was estimated that the building would be used for a period of five years and then torn down. The hospital, however, was used until 1891 when the Dental School moved in and remained until 1908 when they moved into their new building across the street on North University.

In 1908 the building was removed to make way for the new Chemistry Building. It was moved north of the New Engineering Building and was occupied by the Department of Surveying until June, 1918.

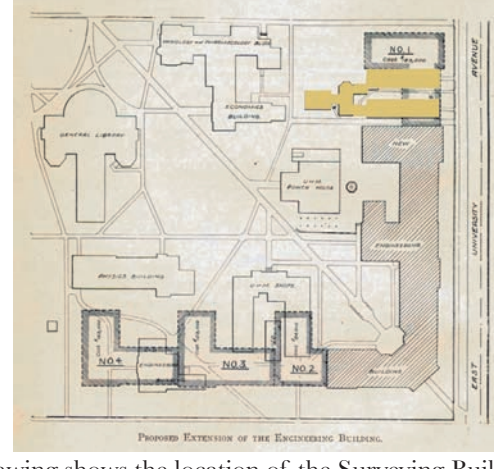
It was rumored that the building lost some parts and gained others in its journey across the campus and that when it was finally put in place on the new site, its general appearance had changed in some details.

The building had always offered a haphazard arrangement of rooms and general design. Professor Davis was able to have some of his personal ideas incorporated in the plans for reconstruction. When he was informed by experts in heating and ventilating that steam radiators should be placed on the floor not far from the windows, he told them, "When the Lord created the earth He placed the heating plant overhead". Accordingly the coils of steam pipe, which were substituted for cast radiators, were placed near the ceiling. (*Michigan Technic*, May, 1919, p. 149)

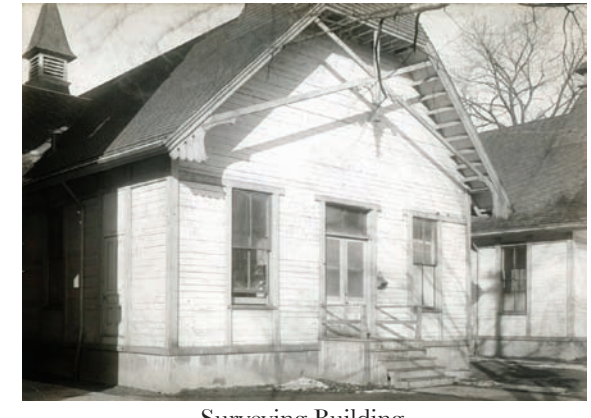
The Surveying Department remained in the Pavilion Hospital for ten years. After that the Department took up residency in the new Natural Sciences Building.

1908

The Pavilion Hospital
North University



Drawing shows the location of the Surveying Building
and proposed expansion of the New Engineering Building



Surveying Building
formerly the Pavilion Hospital

OTHER UNIVERSITY PROGRAMS STARTED IN ENGINEERING

The College of Engineering has played a particularly important role in the history of the University. From its earliest days as the third degree program offered by the University (after LS&A and Medicine), it has enrolled roughly one-quarter of the University's students.

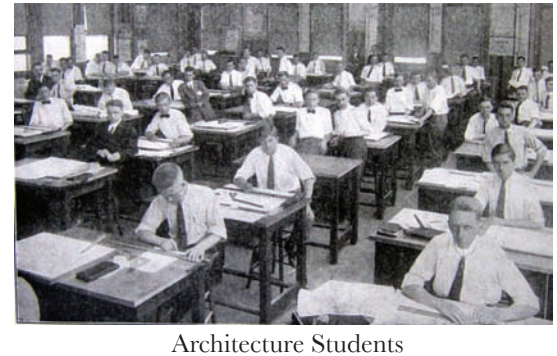
Both the programs in architecture and art were first developed within the College (1906) and did not become independent schools until 1931 and 1972, respectively. Similarly the College of Engineering played a major role in the development of programs in mathematics, finally merging its mathematics curriculum with that of LS&A in 1928. The University's modern languages programs also trace their beginning to instruction in the College in German and French, later joined with the LS&A counterparts in 1929. Public Health can be traced to early instruction offered by Engineering and Medicine in public health engineering and later a program leading to the degree of doctor of public health in 1911. The College even partnered with the School of Forestry and Conservation in developing joint programs in wood technology.

ARCHITECTURE AND DESIGN

William LeBaron Jenney (C.E., Ecole Centrale des Arts et Manufactures, Paris, 1856), a famous architect from Chicago, was appointed Professor of Architecture and Design in 1876. Jenney was the inventor of skeleton construction for large buildings. In 1878, the Legislature failed to renew the appropriation and the school of architecture and design came to an early death. Jenney returned to Chicago.

In 1903 there was once again a strong interest in establishing an architecture program at Michigan, and the matter was referred for study to an engineering faculty committee. In 1905 a professorship in architecture was created, and in 1906 the Engineering faculty developed a curriculum for a degree in architecture and architectural engineering, which was published in the 1906-07 catalog.

In 1906, Emil Lorch was appointed as Professor of Architecture after a request by the state architects. Since there was only one professorship in the program, all other course work was taught by engineering faculty. Although the New Engineering Building was already overcrowded, room was made for the new architecture program.



Architecture Students

In 1893 French or German replaced Latin as a requirement for admission for engineering students and it became a requirement in 1895.

Mortimer Cooley felt that a good knowledge of French and German was so helpful to the accomplished engineer of the time that it was wise to encourage the students to get a good reading knowledge of these languages early in his course.

The requirement of a foreign language and special training in English led to the establishment of separate departments of Modern Languages and English to serve the needs of engineering students. Mathematics courses were also developed specifically for engineering students, although this was not formalized by a department.

Michigan required its engineering and architecture students to take a four-hour course in theme writing and oral expression in their freshman year. The Engineering English Department also offered 16 two-hour courses on an elective basis in subjects such as "Report Writing", "Public Speaking for Engineers", "Contemporary Drama", "The Novel", and "The Short Story". Although the professed aim was to expand the cultural education of engineering students, in reality the program tended to have a focus in technical communication rather than broader liberal studies offered by the Literary College.

PRESIDENT ANGELL RESIGNS

Ann Arbor, Feb. 17, 1909

To the Board of Regents:

Four years ago I tendered my resignation to you in the belief that the interest of the University would be subserved by the appointment to the presidency of a younger man. You declined in such kind words to accept my resignation that I have continued at my post, and rendered the best service of which I was capable.

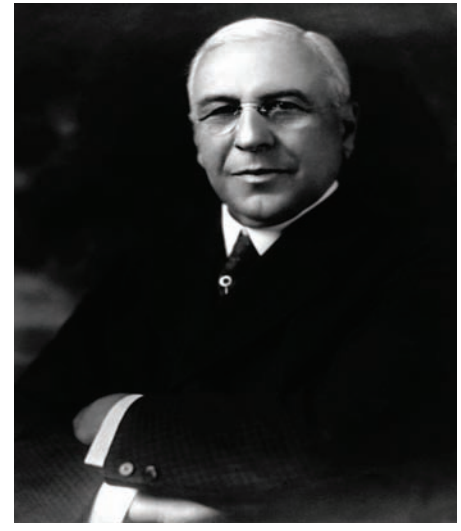
But as I have now passed my eightieth birthday, it is fitting that I should renew the tender of my resignation. I therefore do so with the urgent request that you accept it to take effect at the end of the academic year.

May I take this occasion to express to you again my sincere thanks for all your courtesy and kindness to me?

Yours very truly,
James B. Angell

1909

President Angell on one of his daily walks



Harry Burns Hutchins

1910

Harry Hutchins served as acting President from 1909-1910 and was named President in 1910. He served until 1920.

"Harry Hutchins was already well known on the campus when he was elected President in 1910. He was a graduate of the University, had served as Jay Professor of Law until he resigned to organize the law department at Cornell, and had been dean of our Law Department for fifteen years. He accepted the presidency with a reservation in his own mind which he never forgot. He always felt that his was the duty of carrying forward as thoroughly as he could the aims and ideals of President Angell, to whom he was devoted. He was a man of sound judgement and great integrity. He put the University on a much firmer financial basis, and in general, gave it an excellent administration at a time when this was greatly needed." Mortimer Cooley (*Scientific Blacksmith*, p. 71)

ENGINEERING MECHANICS

The Department of Engineering Mechanics was established in 1911. Prior to that time, instruction in applied mechanics had been given by the Department of Civil Engineering. Courses in this department were required of all engineering students, although a curriculum had been established leading to a degree in Engineering Mechanics. The first degree was conferred in 1913.

CIVIL ENGINEERING
SANITARY EXPERIMENT STATION

The Department of Civil Engineering, under the direction of Professor W. C. Hoad, established a Sanitary Experiment Station in 1912.

The plant was located near the foot of the hill, in a small orchard, about five hundred feet northeast from the General Hospital. The slope was favorable to the layout of the different parts of the plant in a compact and economical manner, allowing the city waste to pass from the city main on Glen Avenue to the station by gravity.

Professor William Christian Hoad

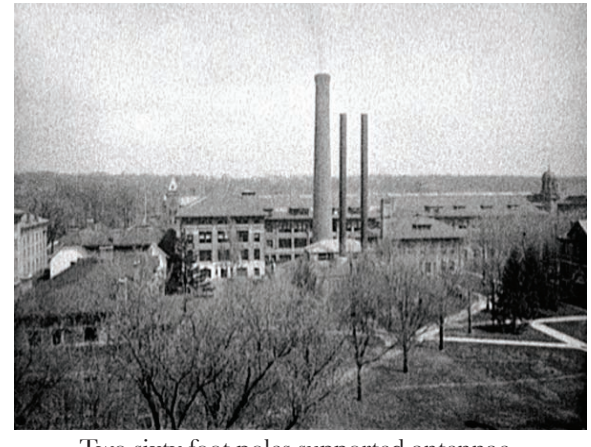
1911

New technologies receiving attention in the early 1900's included the developments in wireless transmission, the electrification of railroads, water turbines, and aeronautics.

The theory of wireless telegraphy and telephony had been taught at the University since 1908, in response to early commercial demand for training in wireless transmission.

A laboratory and broadcasting room was located in the basement on the south side of the Engineering Building, and two sixty-foot poles were placed outside to support the antennae used for sending and receiving messages. Wires were run to the top of the heating plant stack in order to achieve a sufficient height to communicate by wireless radio with Detroit.

1912



Two sixty foot poles supported antennae used for sending and receiving messages.

Professor Hoad:

"With the concentration of the population in cities, the growing pollution of streams and lakes, and the rapidly increasing difficulty of obtaining adequate and suitable municipal water supplies, together with the marked tendency toward the acceptance of higher standards of municipal, no less than of personal conduct, the impending problems of sanitation loom large and important. There must be an increased volume of research work, and much painstaking experimentation, if the sanitary engineer of the future is to be fully equipped for his great task." (*Michigan Alumnus*, December, 1912)


Barbour & Waterman Gymnasium


New Medical Building


Original Medical Building


Anatomy Laboratory

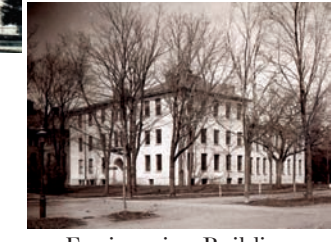

New Engineering Building


Pavilion Hospital


Chemical Laboratory & Pharmacology Laboratory

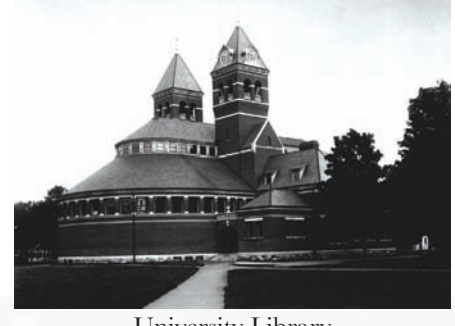

Boiler House


Engineering Shops


Engineering Building


Homeopathic Hospital

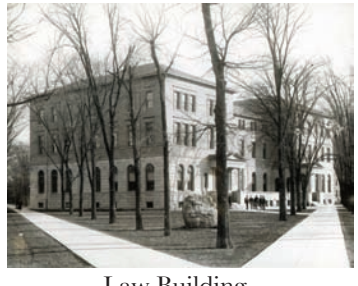

Heating Plant

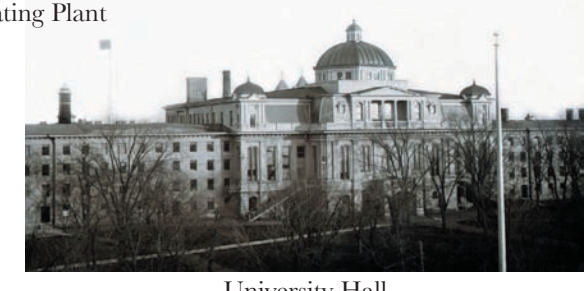

University Library


Physics Building


President's House


Tappan Hall


Law Building


University Hall


Museum


Alumni Memorial Building

THE UNIVERSITY OF MICHIGAN CAMPUS - EARLY 1900s
Richard Rummell Painting

THE ENGINEERING EXHIBIT

In 1913 the Engineering Buildings were opened to the public for the first exhibit of the Engineering Department. This first exhibit was held on May 15 and 16 to coincide with the May Festival. Over ten thousand people toured the facilities and inspected the work of the department. The entire enterprise was conceived and executed by the students, with the faculty playing no major role.

For the average student as well as for the casual visitor, the Engineering corner of the Campus held mysteries almost as profound as the deeper mysteries of the Medical School. But everything was explained during these annual exhibitions.

The Electrical Engineers found an opportunity in the University's telephone equipment and wireless system to give a demonstration of the latest developments in long distance communication. Messages were sent over the wireless without charge. A practical demonstration was also given of many lighting systems, and the evolution of the electric lamp was shown. Outside of the building a complete electric railway with a block signal system gave great pleasure to hundreds of children.

The Surveying students showed a large model of Camp Davis, the surveying camp in the northern part of the State.

The Chemical Engineers, with headquarters in the Chemistry Building, gave a practical demonstration of the manufacture of gas and fuel analysis. Pottery was made, baked and glazed, and a miniature paper plant, complete in every detail was in operation, with souvenirs of the final product for the visitors. Dyes were made and the actual dyeing of material shown. Soap was made in the laboratory and the manufacture of paints and varnishes was practically demonstrated.

The Sanitary Engineering students exhibited practical models of various devices for the purification of sewage.

1913

The Department of Highway Engineering gave a practical demonstration of the different kinds of road materials and structure.

The Department of Civil Engineering demonstrated a complete working model of a modern power development and irrigation project.

Miniature Irrigation Plant

The Mechanical Engineers had a practical demonstration of various types of automobile engines, designed to show their fuel economy and horse power. They also surprised their visitors by sawing wood with a piece of paper running at 20,000 revolutions per minute, freezing flowers in liquid air, and showing a bottle supported only by two narrow wires from which a full stream of water flowed - a mystery solved by few.

The Naval Tank was in full operation, and the method of making and testing the models of all different types of boats was shown. Many models of well known types of flying machines were on exhibit. The War Department provided two full size torpedoes, which were explained by a squad of marines. Two large cannons were also mounted at each side of the Engineering Arch.

The Architecture Students covered the walls of the architectural drawing room with drawings and designs.

The Department of Forestry, Botany, Mineralogy, Geology and Zoology also took part in the exhibit. (*Michigan Alumnus,* May, 1914)

Forestry Exhibit

DEPARTMENT OF ENGINEERING AND ARCHITECTURE

The course in architecture grew under the leadership of Professor Emil Lorch, and in 1913 the Department of Engineering became the Department of Engineering and Architecture, later renamed the College of Engineering and Architecture in 1915.

In 1928 the Department of Architecture moved into its own building, named in honor of Professor Lorch. In 1931 The College of Architecture became a separate unit.

Emil Lorch

THE HONOR SYSTEM

The honor system was established in the College of Engineering and Architecture in 1916. It was instituted at the request of the students, who played a major role in its operation. Based on the principle that it is dishonorable for anyone to receive credit which is not the result of his or her own efforts, the honor code was aligned closely with the ethical requirements of professional engineering practice. The College's Honor Code was quite unique within the University, and it remains in place to this day. All engineering students are required to write or sign a statement on their examination papers that:

"I have neither given nor received aid on this examination nor have I concealed any violation of the Honor Code."

1913 **1916**

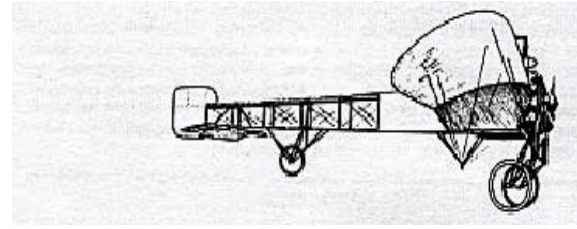
Lorch Hall Sculpture Garden

Lorch Hall

Lorch Hall Studio

Felix W. Pawlowski
From a painting by Leon A. Makielski

Airplanes influential in the early development of Pawlowski's career

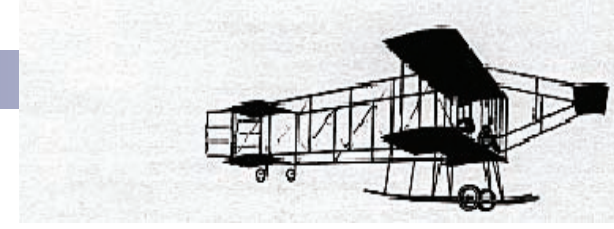


1909 Bleriot...The famed cross-channel model on which Louis Bleriot flew the English Channel in 1909 was powered with a 20-25 h.p. Anzani radial engine.

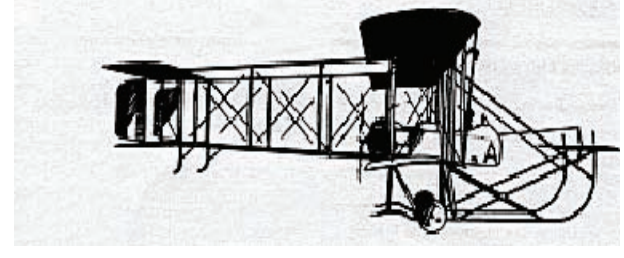
1916

In 1913 Felix Pawlowski, of Warsaw, a practicing mechanical engineer, trained in Germany in the 1890's, came to the United States. He had taken instruction at the first flying school in the world, established by Professor Lucien Marchis in Paris in 1909.

Pawlowski wrote to a number of universities and offered his services in establishing a course in aeronautical engineering. Most of the schools never replied; only two took it seriously. One was M.I.T., which indicated it might be interested in the future but not at the present; the other was the University of Michigan. Dean Cooley wired Pawlowski to come to Ann Arbor and discuss the position. As a result, Pawlowski came to the University as instructor in mechanical engineering in February 1914; he lectured informally on aeronautical subjects until 1916, when the Department of Aeronautical Engineering was established. The first degree was granted in 1917. (Mortimer Cooley notes, p. 71)



1909 Farman...The Henri Farman biplane was powered with a 50-h.p. rotary Gnome engine. Maximum and minimum speeds coincided at about 36 m.p.h.



1913 Farman...The Maurice Farman (brother of Henri Farman) "Longhorn" biplane was a slow but easy to fly airplane. It was powered with a 70-h.p. Renault engine.

Highway and Automobile Engineering in the former Heating and Lighting Plant

Mortimer Cooley never liked having the Power Plant located on the Central Campus. He tells the following story:

"Professor Demmon and I were walking east on the diagonal walk and as we came opposite the power house I crowded Demmon slightly to the right where stood a post and a chimney guy rope just high enough to knock a man's hat off. Demmon's hat went off.

He turned to me indignantly. 'I understand you are responsible for that rope. Why in the world did you put it so low?'

1916

In 1916 the University Heating and Lighting Plant was moved from the central campus to the "Cat-Hole", the swampy area to the northeast of the campus. The vacated building was assigned to the courses in Highway Engineering and Automobile Engineering.

The work in Highway Engineering, occupied the north side of the Building.

A wall was built separating the highway laboratory from the automobile laboratory and a mezzanine floor 20 feet wide was constructed around the sides of the old boiler room.

The basement floor consisted of a large room 44 x 60 feet, in which a large machine for testing bridge floors and large concrete slabs, a concrete mixer, and a paving determinator and mixing floor were installed. Adjoining this room was an underground chamber 16 x 20 feet which was used for a rattler room and in which were installed the brick rattler, the Deval rattler, the rock crusher and the ball mill, so that the extremely noisy apparatus was muffled in an underground chamber.

The south half of the old Heating Plant was used for an Automobile Testing and Exhibit Laboratory. The main laboratory was 37 x 64 feet, exclusive of the offices of the department. A wide gallery ran around three sides of the laboratory on the ground level. The main floor, which was the old boiler room, was considerably below the ground level. Access to it for automobiles for testing and demonstration purposes was made possible by means of an incline at the rear of the east side. (*Michigan Alumnus,* 1916)

Professor Demmon, I replied, I hoped you would ask me that. I explained to him that when we had enlarged the heating plant because of the new buildings on campus, additional smokestacks became necessary in order to increase the capacity of the boilers. These were of metal. I gave instructions to my good friends, the Wickes Brothers of Saginaw, who constructed them, to make these smokestacks as ugly as possible, and in installing them to run one of the guy ropes across the diagonal walk just high enough to knock a man's hat off. The reason for doing this, I told Professor Demmon, was because for several years I have been trying to get the boiler house moved off the campus. Nobody else has been interested, and I can't do it alone. I thought if I could make the boiler house as ugly as possible, and fix the guy ropes so some of the professors would get their heads bumped, I might get some help. Suffice to say, the following year I was authorized to make plans for the present boiler house in the old 'Cat Hole'." (*Scientific Blacksmith*, p. 82)

WORLD WAR I 1914 - 1818

The University of Michigan has long contributed to the defense of the nation during times of war. Because of its heritage (since civilian engineering evolved from military engineering) and the importance of technology to modern warfare, the College of Engineering played a particularly important role in responding to times of national need.

The University had been open less than seven years when the Mexican War broke out in 1858. Five of the 103 students fought in the war, three as officers.

Nearly 2000 Michigan men served in the Civil War under the Union colors, many as officers and non-commissioned officers.

576 Michigan men enlisted in the Spanish American War in 1898. The Hay Bill and the Chamberlin Bill provided a mechanism to develop officers on university campuses, and in 1898 an officer battalion was formed at the University to serve the needs of the war with Spain.

Drills on Ferry Field

Almost immediately after the declaration of war in 1914, two divisions of the Naval Reserves were mobilized and were stationed at their headquarters, in Waterman Gymnasium. Drills were held on Ferry Field. In addition to the gymnasium, other University buildings were brought into use, and State Street was occupied by marching men.

During the war years, the University refocused its efforts on the military needs of the nation, in many cases at the expense of its own academic programs.

Barracks in Waterman Gymnasium

In 1916 voluntary military training of students was started on the campus and was carried on under the direction of Major Clyde Wilson, of the College of Engineering faculty.

"*We do not believe in war, but we do believe in peace—peace with liberty and justice for all. Therefore we are all working for reasonable, defensive, 'Preparedness' which we hope will become permanent".* C.E. Wilson (*Michigan Alumnus*, May, 1916)

At the close of the spring term there were as many as nine hundred men in training. Victor Vaughan, Dean of Medicine, Mortimer Cooley, Dean of Engineering and Henry Bates, Dean of Law were all active in promoting the work of the Security League. Here it should also be noted that several professors connected with the Department of German used their classrooms for active German propaganda and were consequently dismissed.

Class in visual signaling (Semaphore)

The College of Engineering and the Law School modified their courses so that at least two days a week were devoted to drill. To supplement these drills the Engineering faculty started an elementary course in military engineering enrolling some 210 students, including 30 from the Literary College. Special courses were given in signaling, munitions, railroad transportation, automobile engineering, and the classification and handling of stores.

Class in the New Engineering Building

Communications

Surveying

Class in the Engineering Shops Foundry

Code Training

Early in 1918 the University was requested by the government to determine how many men could be trained on campus to serve as army mechanics. A reply was made that two hundred could be accommodated. Washington expected a larger commitment, and with the use of additional temporary barracks seven hundred men were trained.

"Spanish influenza" struck the Michigan campus in October of 1918. This was during the period of the S.A.T.C. (Students' Army Training Corps), which enrolled approximately 3,600 men housed in hastily prepared barracks contrived out of fraternity houses and the half-finished Michigan Union. When the flu came 1,207 members of the S.A.T.C. were stricken, with 59 deaths occuring.

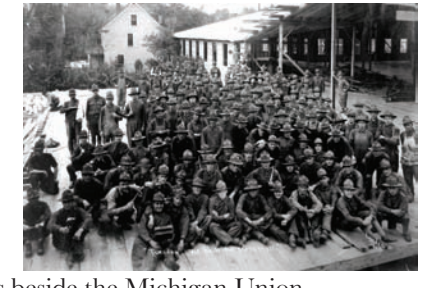
The infirmaries of the military units and the hospital facilities of Ann Arbor were strained by this emergency. The women of the city, under the leadership of the Ann Arbor group of the American Association of University Women, helped to feed and nurse the sufferers. Barbour Gymnasium became an auxiliary hospital.

Barracks in the Michigan Union

Army Students' Mess
Michigan Union Ballroom

Navy Students' Mess
Michigan Union Pool

The Michigan Union Kitchen



Building a Temporary Mess beside the Michigan Union

ENGINEERING RESEARCH

In 1920, the Department of Engineering Research was established. It offered an official mechanism through which the research in engineering and related fields of work could be made available to the civic and industrial interests of the State and elsewhere. The function of the department was largely administrative. The work was done by the Engineering faculty in their laboratories. Students worked as assistants, giving them valuable experience in research, although no student credits were given. The department was under the direction of Albert White.

Albert E. White

The enrollment in Engineering continued its rapid growth, from 400 in 1900 to 1,300 in 1910 to over 2,000 in 1920. The capacity of the New Engineering Building was quickly exceeded by the rising student numbers, and university laboratories had to be housed in temporary buildings around the campus. But even with these short-term measures, there was still not enough room, and many engineering subjects had to be dropped.

1920

As the *Michigan Alumnus* described it in 1939:

"Through the Department of Engineering Research the University put at the service of manufacturers and industrial concerns the technical knowledge of its staff and its unusual facilities for solving problems fundamental to applied science. Your washing machine runs more quietly because of research on mechanical noises done in the Michigan laboratories, and many manufactured products in daily use are machined with greater accuracy by virtue of measuring devices which Michigan investigators have contrived." (*Michigan Alumnus*, 1939-40)

Albert White joined the Chemical Engineering faculty in 1911. During the war years he was in charge of the Metallurgical Branch of the Inspection Division, Ordinance Department of the United States Army, and later was placed in charge of the Metallurgical Branch and Technical Staff. Professor White returned to the University in 1919 and was appointed Director of the Department of Engineering Research.

There were other space pressures. The Engineering Shops were inadequate to meet the needs of the engineering programs. The space occupied by Chemical Engineering in the Chemistry Building was urgently needed by the Department of Chemistry.

The doubling of enrollments during the 1910-1920 period to over 2,000 students brought Engineering to a crisis point in its needs for additional space.

In 1922, as a stopgap measure, the University purchased the old Tappan School building on East University, renaming it East Hall, and gave it to Engineering for use in its classes in non-technical subjects such as Engineering English. This old building had been constructed in 1883 as a city school. The name "Tappan School" remained on its north face. It was condemned for elementary school purposes by the state fire inspectors in 1922, and became available to the University.

Several of the classrooms were considered to be too large, so they were partitioned into sizes more suitable for university work. The building was connected to the university light and heating system.

East Hall
Former Tappan Elementary School

1922

Needless to say, this castoff addition to the Engineering campus was not highly regarded. An article in the *Michigan Technic* put it this way:

"It is the ugly duckling of the engineering family. After wandering through a maze of narrow passages and inter-connected classrooms, the student perhaps comes to a door on which are inscribed the desired numerals, where he is safe till it is time to go out. Then if he is particularly unlucky he will fall into a trap set by Professor Brackett, who has very cunningly established his office right on the spot where even a wandering Freshman is sure the door to the Great Outdoors and Freedom is located.

There are all sorts of rumors about the old school. Many cubic feet of the basement are completely blocked off from curiosity satisfiers. In the disused belfry live pigeons who are said to be descended from those who performed heroic messenger service in intra-campus battles of former years. Directly under the north entrance-way there is a large cistern. Nobody seems to know the reason for its existence, but it has been suggested that a trap-door in the floor would furnish excellent facilities for such ceremonies as baptisms or sacrifices to the engineering gods." (*Michigan Technic*, October, 1939, p. 28)

Offices of the Engineering English Department were located in East Hall, along with the classrooms for the courses in English and mathematics.

East Hall

The University finally responded to the needs of the College with plans for a large new building, named East Engineering. Although this was originally envisioned as a monumental structure, designed to meet the needs of the College for decades to come, the final plans were far less ambitious and would require further expansion in later years.

Schematic Drawing for East Engineering

1923

The East Engineering Building was completed in 1923. It housed the Chemical and Metallurgical Department, the Department of Metal Processing (formerly in the Engineering Shops), the Department of Engineering Research, the Division of Transportation Engineering, the State Highway Laboratories, the Department of Aeronautical Engineering including the wind tunnels, the East Engineering Library for these departments, and the Transportation Library containing over 100,000 books dealing with every aspect of transportation.

Thirty houses on the property were removed to accommodate the East Engineering Building. They were moved to other locations, so that the University building program would not contribute to the loss of housing in Ann Arbor.


The first section of the East Engineering Building
East Hall (left), Firehouse (center), East Engineering (right)

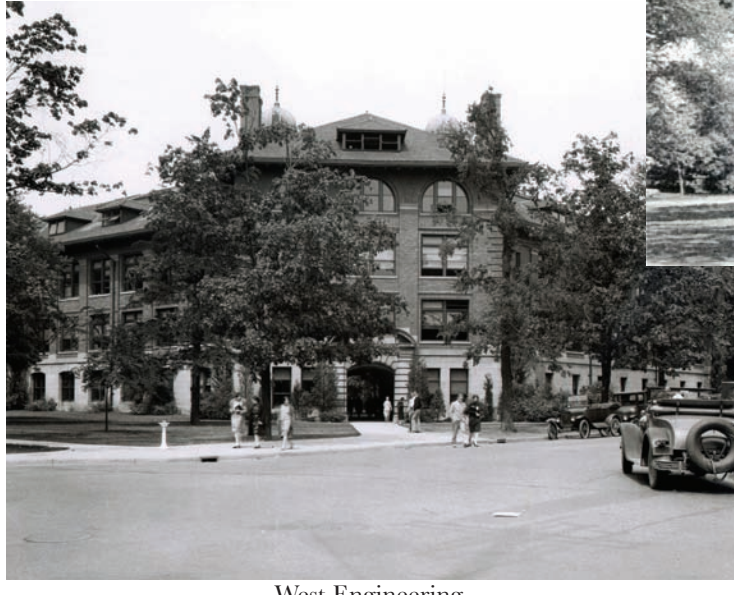
In the 1920's the buildings of the College of Engineering consisted of West Engineering, The West Engineering Annex (Engineering Shops), The Old Power Plant, East Engineering and East Hall.

Highway & Automobile Engineering - Former Heating and Lighting Plant

West Engineering, West Engineering Annex (right), Old Heating Plant (front)

1920's ENGINEERING FACILITIES

East Hall



West Engineering

East Engineering

A VISITOR'S TOUR OF THE UNIVERSITY OF MICHIGAN CAMPUS IN THE 1920s

One can gain an interesting impression of the College of Engineering campus in the 1920s by summarizing one of the walking tours provided to visitors to the University during this period:

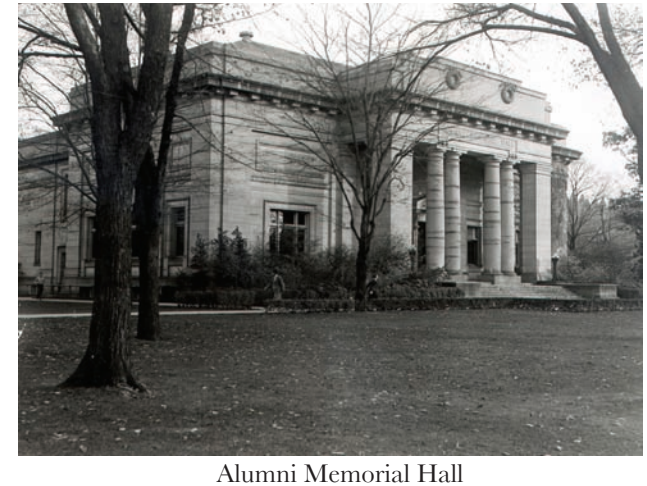
The University visitor who starts a tour of the campus from the Michigan Union is favorably impressed with the beauty of the University buildings. After looking up at the square tower of the Union, flanked by its scholar and its athlete,

The Michigan Union Tower

The Michigan Union Statues
"Learning", looking toward the Campus.
"Athletics", looking toward Ferry Field.

the visitor turns toward the Campus and admires the granite colonnade of Angell Hall and the more weathered portico of the Memorial Building.

Angell Hall



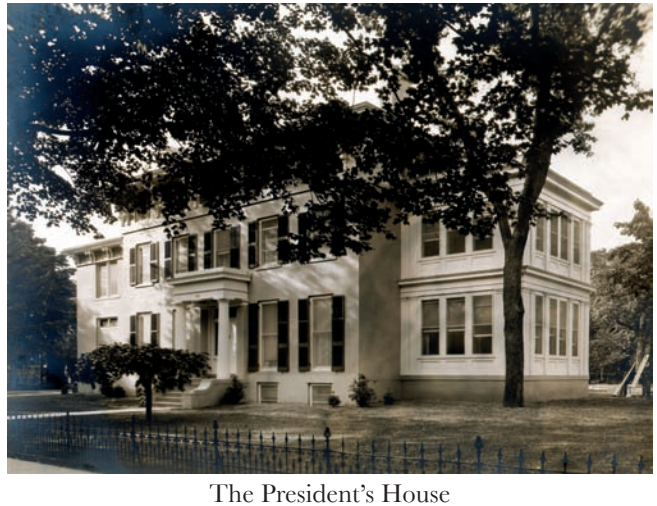
Alumni Memorial Hall

To the right are the cathedral windows of the Lawyer's Commons and the long stretch of aged-stone bay windows of the dormitory.

The Lawyer's Commons

Law Dormitory

As one proceeds along the show street, South University Avenue, one delights in the domestic touch that the President's home gives to the Campus.



The President's House

Across the street Portia stands above the doorway of the perfect dormitory, named after Martha Cook.

Portia

Again to the left is the jewel of the Campus, the Clements Library, which looks across the landscaped garden of the Martha Cook Dormitory toward the realization of the University architect's artistic dreams, Lorch Hall.

Clements Library

Lorch Hall

But then.....

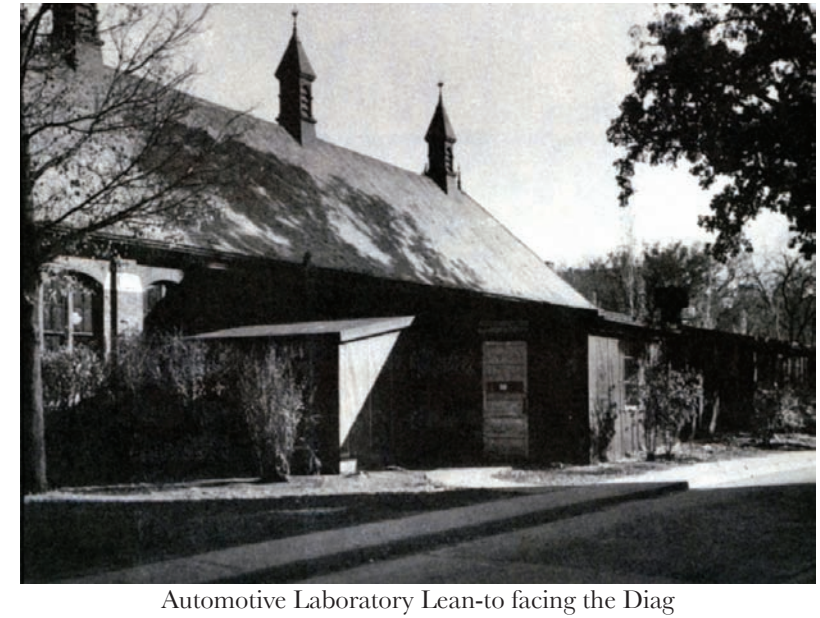
As the visitor turns again to the Campus, the admiring comments suddenly cease, for there behind a muddy parking yard, with its dirty cars, trucks, and cannons, is the lean-to shed, painted barn-red, which houses the Automotive Laboratory.

This wooden shanty rests against the old brick-red walls of the Engineering Shops, whose ridge-pole is surmounted by fragments of an ornamental iron fence. Just to emphasize the rundown atmosphere, a boxlike bridge, supported by heavy poles, connects the rear of the shops with a corner of the neat Engineering Building.

Automotive Laboratory Lean-to (left)
next to Clements Library facing South University

Born in the temporary buildings constructed for the Student Army Training Corps during World War I, this youthful and most modern of projects in the University, the Department of Automotive Engineering, found itself homeless when construction of the new Physics building started. Foundations were hurriedly laid in some steel sheds which were then upon the site of the Clements Library, but before the engines could be moved to their platforms these sheds also were wrecked to make way for the library. The basement of the Engineering Shops was then allocated to the automotive engineers, together with the shed which is supported by its west wall.

Engineering Shops - facing South University

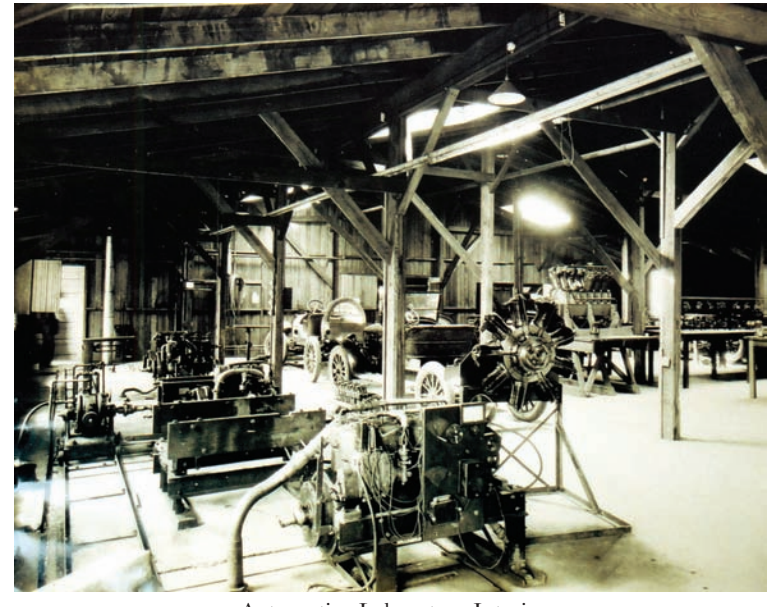


Automotive Laboratory Lean-to facing the Diag

Ugliness is only skin deep in this case for the interior of the building is the neatest and best arranged of automotive laboratories. Of course, when it snows in Ann Arbor for one day, it rains in the shed for two weeks in as much as the melting snow upon the slightly slanted roof slowly leaks through the rotted boards. Waterproof canvas coverings are placed over the engines used in tests to prevent moisture from interfering with research.

In the lean-to are mounted the motors of many of the leading automobiles ready for tests. Dynamometers are mounted on tracks and ball bearings so that they may be swung about to serve a number of motors. Pipes connect the exhausts of all motors with a ventilating fan to keep the gases from the room. Automobile manufacturers who appreciate the research willingly conducted for them by the Department have donated all of the equipment.

Automotive Laboratory Interior



Automotive Laboratory Interior

Within a radius of one hundred miles of Ann Arbor are situated most of the automotive plants of the United States. Considering the work done in this department, the nearness of Ann Arbor to Detroit industries, and the evident encouragement of these manufacturers, the housing of equipment for automotive engineering is not by any means of the type to be expected. And besides, the old shed spoils the University's skyline.

(*Michigan Alumnus*, 1928-29, p. 408)

In 1928, at the age of 73, Mortimer Cooley retired, and became Dean Emeritus of the College of Engineering and Architecture. He had served the University for 47 years, 25 of those years as Dean of Engineering.

Under Cooley's leadership, both West and East Engineering were built, East Hall was acquired, the departments of Aeronautical Engineering and Engineering Research were started, the Mentor system was established, and the Honor System was instituted. The policy of selecting outstanding professors for the departmental heads became a strong tradition of the College of Engineering.

Mortimer E. Cooley

1928

When Cooley arrived at Michigan in 1881, there were only 30 students in Engineering, taught by three faculty members. When he retired as dean in 1928, the College had grown to over 2,000 students and 160 faculty.

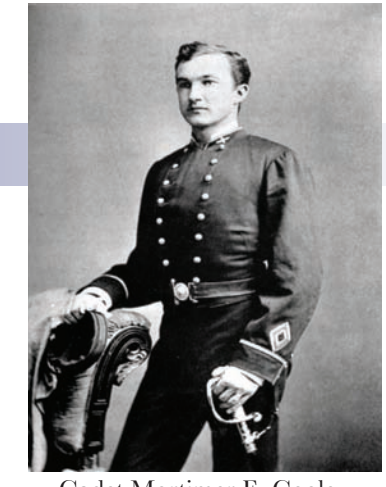
Tappan's words guided Cooley's faculty choices: "There is no safe guide in the appointment of professors save in the qualifications of the candidates."

But Cooley added another key asset:
"That I was free to engage in many activities was largely owing to Mrs. Cooley. She not only took pleasure in maintaining open house for my students and friends as well as for her own many friends, but she was a devoted mother to our four children. Young people came to her frequently for advice and understanding, and she was never too busy to spend time with them. No man can be any more of a success than his mother and his wife make of him; to the two gallant gentlewomen in my life I have never failed to admit my indebtedness." Mortimer Cooley (*Scientific Blacksmith*, p. 196)

Caroline Elizabeth Moseley Cooley
Photo taken at the time of her marriage

Caroline Cooley died at the Cooley home on Hill Street the night of October 19, 1932, after a year long illness. Mortimer Cooley died at the age of 89 on August 25, 1944.

Mortimer Cooley did not receive his B.S. degree from the Naval Academy until 1936 at the age of 82. By an act of Congress in the 1930s, the Superintendent of the Naval Academy was authorized to confer "upon all living graduates who may be recommended for such award the degree certificate which other institutions of higher learning customarily have bestowed". Although many Naval graduates had gone on to post-graduate work, the universities recognized their commissions with bachelor's degrees.



Cadet Mortimer E. Cooley

Cooley's son, Hollis M. Cooley, graduated from the Naval Academy in 1906, and the Dean's grandson, Hollis W. Cooley, graduated in 1936. This young man received his B.S. at the time of his graduation. Later the father, Captain Cooley, was awarded his B.S. and finally the grandfather, Dean Cooley was so honored. Thus the first in that family to graduate was the last, and the last was first, to receive his degree. (*Michigan Alumnus*, 1937-38, p. 183)

Herbert Charles Sadler
1928-1937

Henry Clay Anderson
1937-39

Ivan Crawford
1940-1950

DEANS WHO FOLLOWED MORTIMER COOLEY

Herbert Charles Sadler succeeded Mortimer Cooley as Dean of Engineering in 1928. Sadler was an internationally known naval architect and had been the first chair of the Department of Naval Architecture and Marine Engineering. When Sadler became dean, after serving on the faculty for 37 years, the nation was about to enter the Great Depression, a time when the University would be under great financial hardship. Although enrollments increased slightly during Sadler's years, the budget of the College declined during the depression, and further growth of the Engineering Campus was stagnant.

Henry Clay Anderson, became Dean in 1937. He received his degree in Mechanical Engineering from the University of Kentucky and he immediately went to work for the Cincinnati, New Orleans and Texas Railroad at Chattanooga, Tennessee Railway Company as Assistant to the Master Mechanic. In 1900 he came to the University of Michigan as Instructor of Mechanical Engineering, and in 1917 he became head of the Department. As a member of a firm of consulting engineers, he designed and constructed many large power and heating plants, hospitals, and all manner of public works while at Michigan. He was dean for only a brief period from 1937-39. His health was poor and he died on October 14, 1939.

Ivan Crawford was the first Dean of Engineering recruited to Michigan from another university. Crawford earned a degree in civil engineering from the University of Colorado, and after a brief period on its faculty, became dean of engineering at the University of Idaho in 1923. He then went on to become dean at the University of Kansas in 1937, before joining Michigan as its new Dean of Engineering and Professor of Civil Engineering in 1940. Crawford led the College during the war years, a time when Engineering refocused its efforts to respond first to the war needs of the nation, and then to the enormous demand for engineering education from the returning veterans on the G. I. Bill.

When the United States entered the war in December, 1941, it was obvious at once the University of Michigan would be deeply affected. In preparation for the inevitable changes, early in January the University Committee on National Defense was replaced by the University War Board. Larger than its predecessor, and with broader duties, the new board was assigned the task of expediting the transition of the University from a peacetime to a wartime basis. It was established as an arm of the office of the President.

Among the first actions was that of revising the 1941-42 calendar by reducing the length of examination periods and eliminating the spring vacation period. Professionally and technically trained students were made available for war work almost three weeks earlier than the normal schedule would have permitted.

The urgent need for trained technicians dictated that the University would operate as nearly as possible on a year-round basis. The War Board recommended that the University offer three full terms of instruction during each calendar year.

The Board encouraged the College of Engineering and other units to invite the armed forces and civilian governmental agencies to send selected groups to the University for specialized training and offered its assistance to facilitate this procedure.

Before the end of the year arrangements had been completed to provide training in surveying and photogrammetry, ultrahigh-frequency technology and aircraft engine inspection as well as to continue the large program in engineering and management training under contract with the United States Office of Education.

Recognizing that it was primarily the function of the armed forces to provide training in the combat application of fundamental skills, the board did not follow the lead of some colleges in recommending specific military preparation for all students. Instead the University continued its emphasis on undergraduate education in the humanities, social sciences, natural sciences, and the professional disciplines, augmenting this instruction with course work addressing the specific needs of the wartime military and stressing significant work in physical conditioning of students.

A good many credit courses, some of them new and some of them modifications of previously existing courses, were designated as offering preparation for war service. These were found mainly in engineering, foreign languages, political science, history, and economics, in the physical and biological sciences, and in business administration. The Michigan League, under the leadership of Ethel A. McCormick and working with the American Red Cross, sponsored a number of noncredit courses in nursing, first aid, nutrition, motor mechanics, and typewriting.

The College of Engineering offered a special course to women in Engineering, Science, and Management preparing them for war jobs. This program put many young women in the predominately male school and more than 150 women frequented the halls of the West Engineering Building. Surveying, Topographic Mapping and Photogrammetry were taught in this course. The graduates had the rating of "Engineering Aids", with starting salaries of $1,800 per year. The young women came for the thirteen-week course and worked hard, handling a class load of 38 hours per week, with classroom and field work on the schedule.

Women also came to the College of Engineering for training to be prepared for aircraft inspection work. Military map making was taught to qualified second-term senior women in a special course offered at the request of the Army Map Service. Women were given instruction in making bombing target maps for use by the Air Force.

The Army and Navy developed college programs to assure themselves a steady supply of professionally trained officers and technicians. Welcoming such a program, Michigan made a major commitment to instructing soldiers, sailors, marines, and coast guardsmen with its own faculty. The work proceeded on a year-around basis for three terms.

In the summer of 1942, the University War Board supported President Ruthven in his position that the University take contracts for training war personnel only if it involved using University faculty members. In many instances, the faculty members had to take refresher courses to teach classes they had never taught before.

In the fall term of 1943 there were over 4,000 military personnel on campus. The Army had stationed more than 2,300 soldiers at Michigan. They were studying engineering, meteorology, foreign languages, military government of occupied territories, medicine, dentistry, and military law. The Navy sent 1,500 sailors, marines, and coast guardsmen for basic training in science and history, medicine, dentistry, and naval architecture. More than 200 nurses in the School of Nursing were enrolled in the U. S. Cadet Nurses.

There was a significant decline in the enrollments of traditional civilian students. However, the presence of Army and Navy personnel brought the enrollment to numbers which demanded the full utilization of all the University's facilities.

Many of the workers at the Willow Run Bomber Plant along with hundreds of others who had come to Ann Arbor for work in the local war industries, made the housing problem a critical one for both University officials and the city.

Approximately four thousand men wearing the uniforms of the Army, the Navy, the Marine Corps and the Coast Guard enrolled for the Fall Term of 1943. Of these, more than 2,300 were soldiers, housed in the East Quadrangle, Vaughan House, Fletcher Hall and leased fraternity houses. Many of the latter were available with the falling off of civilian fraternity men. The others were quartered in the West Quadrangle, with the majority of the officer personnel living at the Michigan Union.

The wartime atmosphere had some amusing features such as the decision to reset campus clocks:

"A little confusion has been in the air during the past week as to what time it is–the reason being that Ann Arbor is on Eastern War Time and the University is on Central War Time, or an hour earlier than the city. To make things easy, the time of classes has been set forward an hour, so under the new system students go to class at eight o'clock Ann Arbor time, and arrive in the classroom at seven o'clock, University time–or thereabouts. To a stranger arriving in Ann Arbor, things might seem a little strange at first, when he gets off of the train at 1:30, for instance, and forthwith arrives at the Michigan Union an hour earlier." (*Michigan Alumnus*, January 20, 1945, p. 217)

The war work administered through the Department of Engineering Research alone engaged the services of a large staff. In 1942, when more than three-quarters of its projects related to the war, about 500 persons were employed. As F. Clever Bald described it in his role as University War Historian:

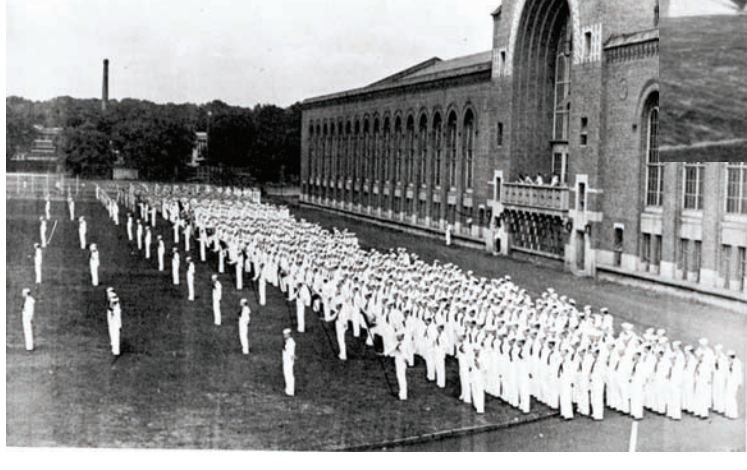
"Some day, when the government-imposed veil of secrecy may be lifted from the activities of the University's Department of Engineering Research, thrilling stories of scientific achievement can be written. Now it is possible only to suggest the size and the importance of the research program by calling attention to significant statistics. For instance, the total cost of research projects for the academic year 1944-45, was approximately $4,800,000. This was 3.6 times the figure for 1943-44, and 8.5 times that for 1942-43.

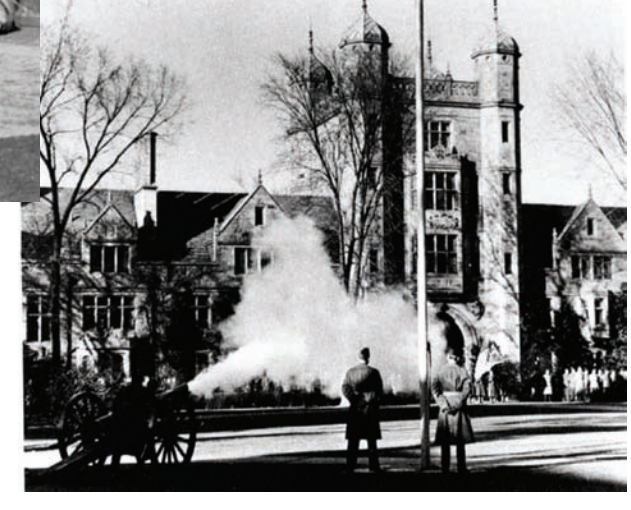
The number of projects in progress on July 1, 1944, was 113. Eighty-six were received during the year and eighty-three were completed, leaving 116 projects active on July 1, 1945. Ninety per cent of the work was sponsored by government agencies, and much of the remaining ten per cent, which was for industrial corporations, was directly related to the war effort." (*Michigan Alumnus*, December 1, 1945)

What is all the more remarkable was that in the midst of this massive effort to support the nation's wartime needs, the University managed to remain intact as an educational institution and sustain its core academic programs.


War Bonds
and Stamps


EAST
ENGINEERING



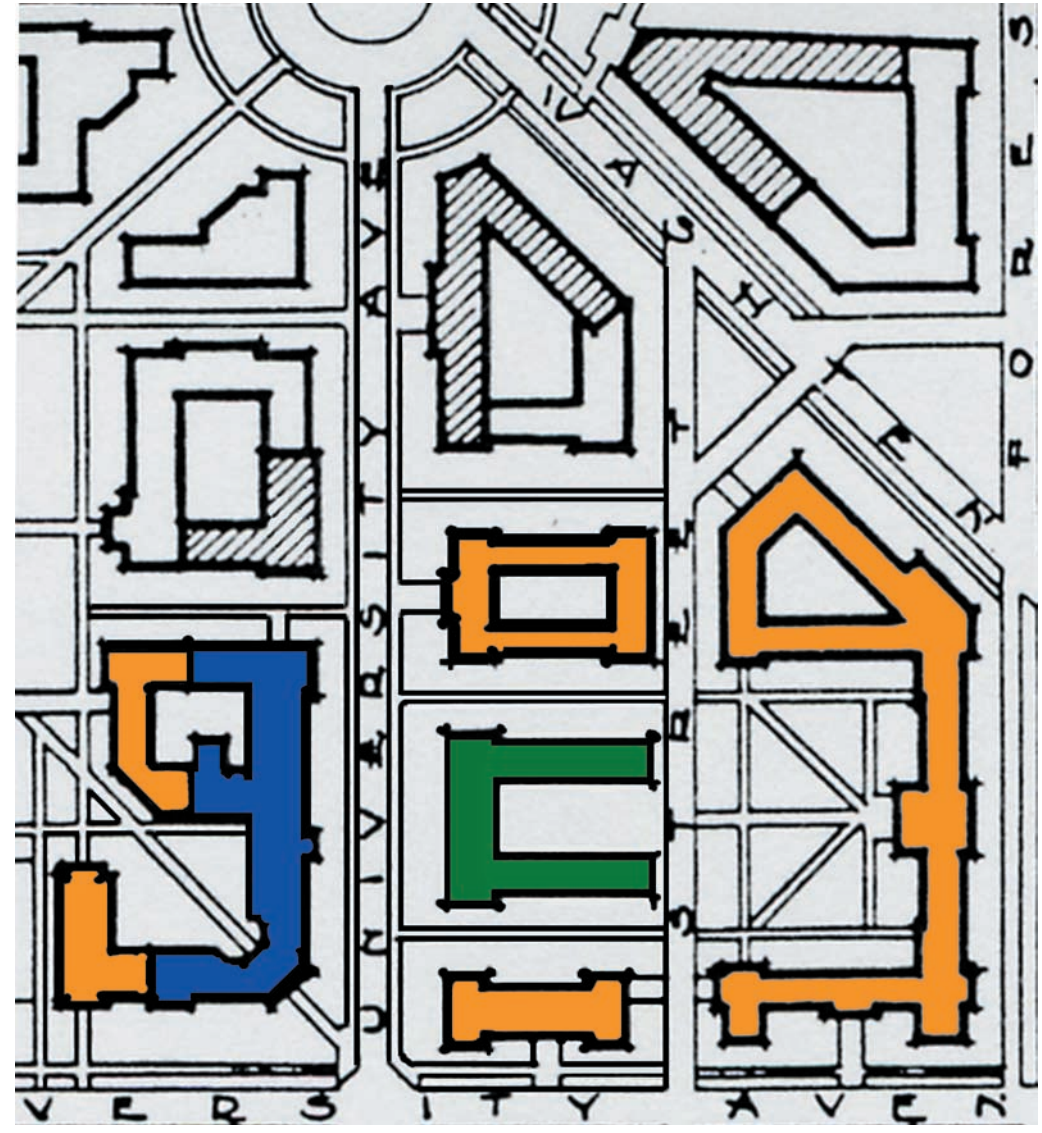


POST WAR PLANNING

In 1944 the University conducted an exhaustive survey and study for meeting the needs of the veterans returning to college from wartime service. The report stated that "The University of Michigan commits itself to the proposition that the educational needs of war-service veterans and, hence, of the community must be met to the fullest extent its facilities will allow."

A plan was developed for a major expansion of the Engineering campus to meet the anticipated enrollment growth. This plan, shown on the right, envisioned the development of an "Engineering Quadrangle" to the east of the campus, along with a major expansion of West Engineering. (*Michigan Alumnus*, December 18, 1943, p. 183)

Unfortunately, funding was limited in the late 1940s, and this ambitious plan was never realized. However, it is interesting to consider the plan as a possible alternative to the move of the College to the North Campus during the 1950s through the 1980s. It does suggest that had the University moved early, it would have been able to accommodate the growth of the College of Engineering while keeping it intact on the Central Campus.



The "Engineering Quadrangle" West Engineering (blue), East Engineering (green)
The orange buildings are the additions and new proposed buildings.

East Engineering Addition (right)

East Engineering Addition Classrooms

1947

In the fall of 1941, just prior to World War II, the College was thought to have reached its enrollment capacity at 2,070. Yet as the war ended and veteran students returned, the College's enrollment had grown to over 4,500 in 1947, including 2,967 veterans.

The dilemma facing the College was familiar: Either reduce enrollments or build new facilities. Although the University did not have the capacity to launch the massive plan developed in 1944, it did commit the funds to expand East Engineering.

The new addition opened in 1947 to house the Departments of Electrical Engineering and Aeronautical Engineering, while Naval Architecture and Civil Engineering took over the vacated space in West Engineering. More specifically, Aeronautical Engineering occupied the entire first floor of the new wing, while Electrical Engineering occupied most of the remainder of the floors, with both departments sharing space in the basement and fourth floor.

Among the modern facilities made available to the Department of Aeronautical Engineering were instrumentation, dynamics, and propulsion laboratories. On the top floor of the new addition was also an aerodynamics laboratory which housed a small wind tunnel, a smoke tunnel, and an axial flow blower.

In the basement of the building the Department of Electrical Engineering occupied three alternating current and two direct current laboratories, in addition to one dynamometer and one photometric laboratory, an instrument room, dark room and store room. On the second floor was a control room and laboratories for industrial heating, rectifier, heat transfer, small motors and servomechanisms. Third floor facilities included office space, a computing room and laboratories for insulation, radio, instrumentation, measurements, calibration, magnetons, and microwave tubes.

On the top floor was additional office space, an instrumentation room, a shielded room and more laboratories for electronics, high frequency, ultra high frequency, telephone and telegraph, radar, microwave and electron tubes.

1950s

Space was still inadequate to accommodate the post-war growth of Engineering and even more so for the University. In anticipation of this growing need, the Regents had begun to acquire farmland property on the sloping hills lying just to the northeast of the Huron River.

Although there were some early thoughts given to relocating the School of Education, Natural Resources, Music, and Fine Arts to the North Campus, the construction of the Phoenix Memorial Project soon repurposed the site for engineering research. More specifically, the early plans for the North Campus included:

•The construction of the Cooley Memorial Laboratory to house the electronics research associated with the Willow Run Laboratories.

•The construction of the Phoenix Memorial Laboratory.

•The construction of the automotive laboratory and a storage library.

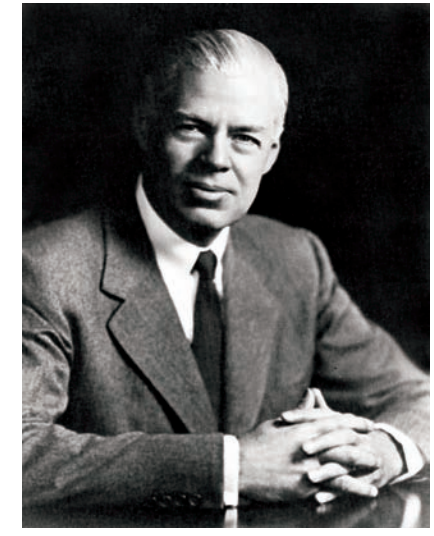
The development of the rest of the campus would proceed as needs arose and funds were secured. Possible projects suggested for the long-range future included a fine arts center where teaching facilities in music, theater, television, architecture, and design could be concentrated; residence halls and multiple-housing units for both single and married students, and staff; and facilities for the study of natural resources.

On January 17, 1952, the newly appointed president of the University, Harlan Hatcher, held a press conference to announce plans for a new North Campus for the University:

"The increasing responsibilities and demands upon the University and the projection of necessary growth in the future have made it imperative that plans for expansion be formulated now. Of course, there must be some further construction on the present campus, but we know now that there is not adequate space for an enrollment of 25,000 students or more, which it is reasonable to anticipate in the 1960's." (*Michigan Alumnus*, 1951-52, p. 257)

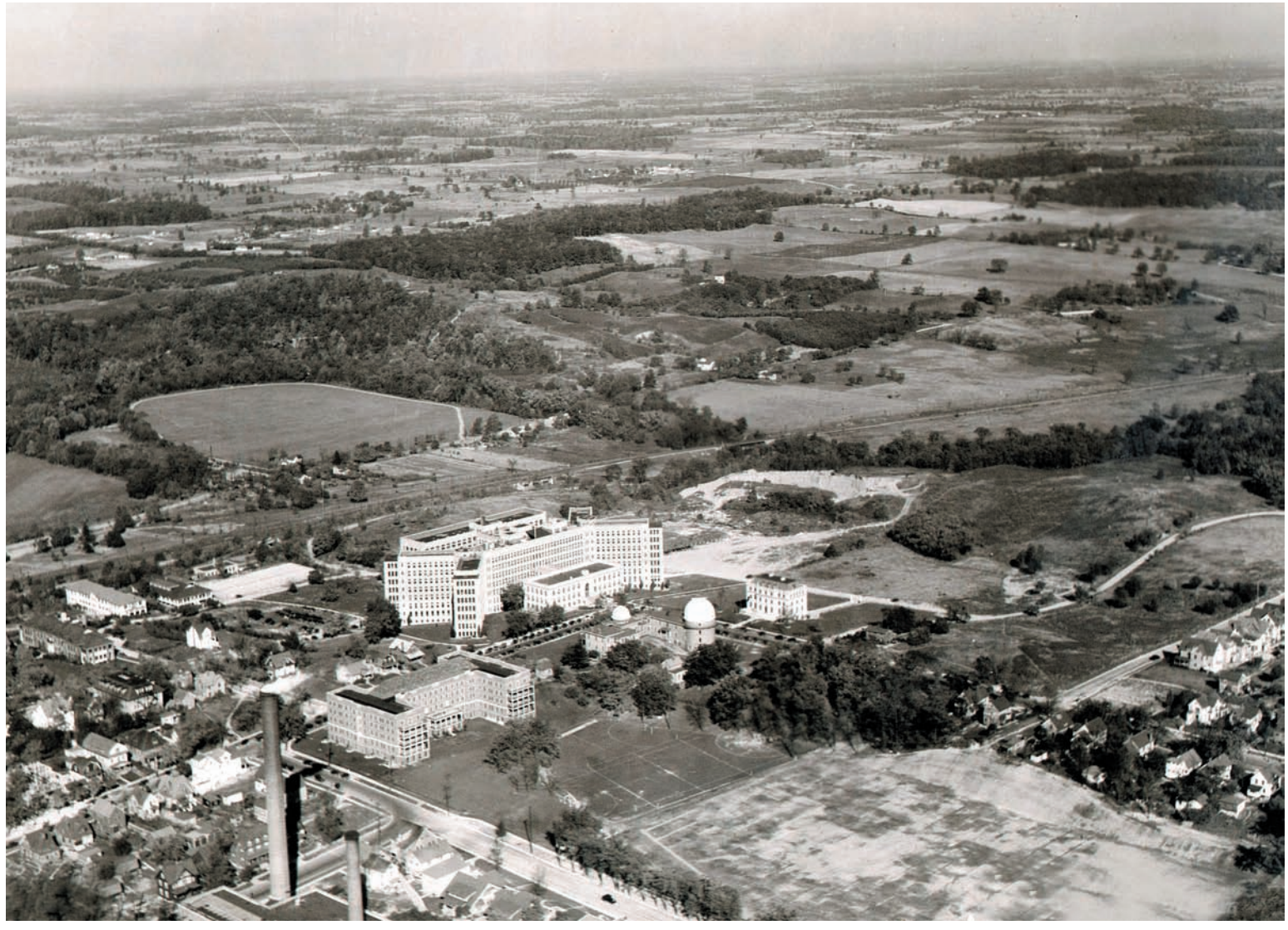
Key in this massive expansion plan was the Vice President for Business and Finance, Wilbur K. Pierpont. A native Michigander, Pierpont graduated from Central State Teachers College in 1934. After teaching high school mathematics and coaching basketball at Belding, Michigan, he decided to come to the University of Michigan for graduate work. In 1942 he earned a Master's degree in Business Administration and then a Ph.D. During WWII he worked as a price analyst in the War Department and served in the Fiscal Department of the Bureau of Ordinance as a Navy Lieutenant.

In 1946 Pierpont returned to the University to work first with President Ruthven and then President Hatcher as the University's chief financial officer. The early purchase and development of the North Campus can be traced to Pierpont, who saw the needs of the growing University. His contributions were later honored in 1995 by the naming of the Wilbur and Maxine Pierpont Commons.



Harlan Hatcher

Wilbur Pierpont



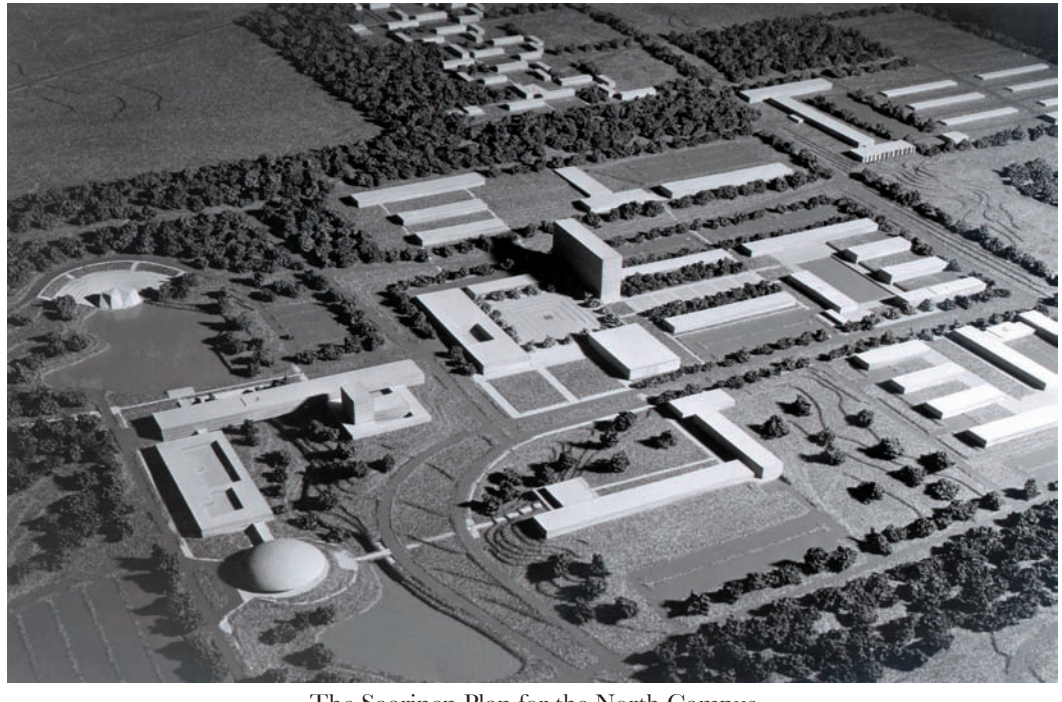
A view of the farmland across the Huron River from the University Hospital

1950s

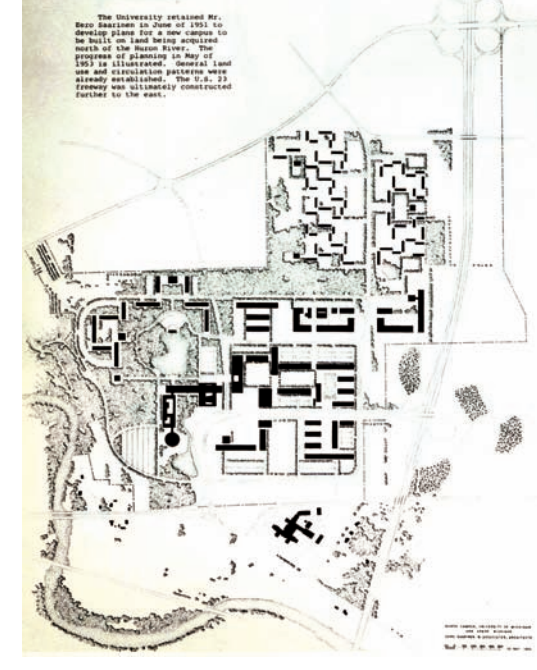
The noted Finnish architect, Eero Saarinen, then director of the Cranbrook Institute and the son of the former University faculty member, Eliel Saarinen, was retained in 1951 to develop the master plan for the North Campus site. Saarinen was one of the most creative architects of the 20th Century, noted for his bold designs including Dulles International Airport, the St. Louis Arch, and the residential colleges at Yale.

Ironically, at the time Saarinen was commissioned to develop the plan for the North Campus, he was just completing the design for the General Motors Technical Center in Warren, Michigan. There is a striking similarity between the two designs, even including an exhibition dome, typical of automobile development centers, to display new models.

Eero Saarinen



The Saarinen Plan for the North Campus

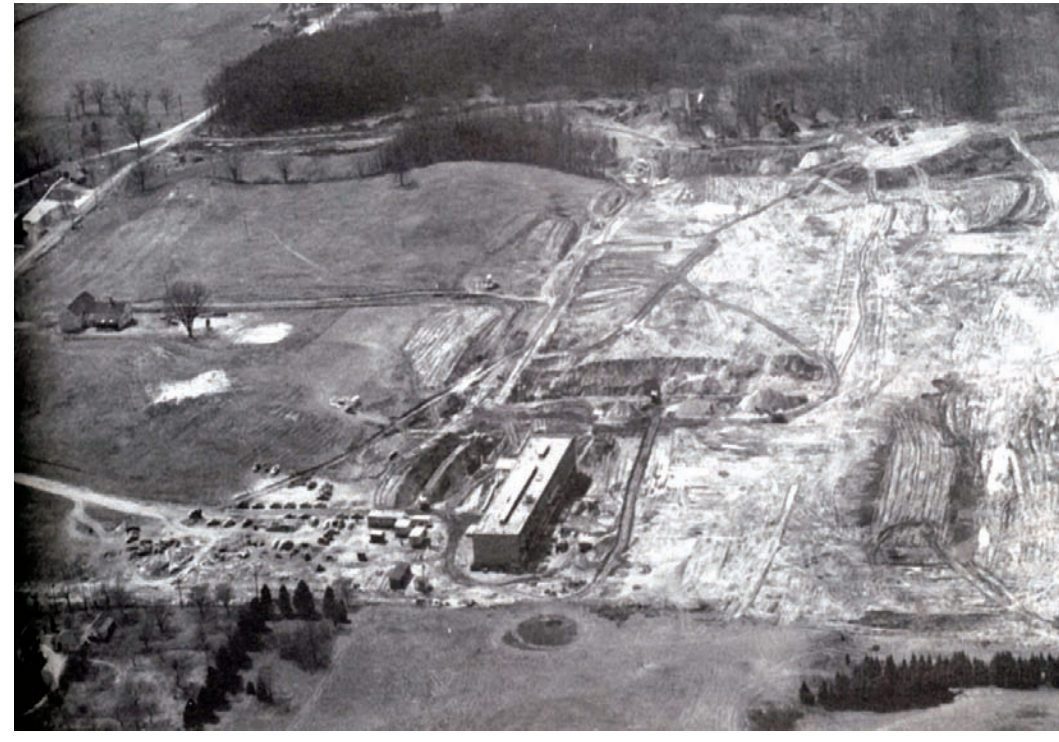


1950s

The College of Engineering grew and flourished during the early part of this period, due in part to the importance of engineering education and research to national security, as well as to the forceful leadership of Dean George Granger Brown, a distinguished faculty member and chair of the Department of Chemical and Metallurgical Engineering.

Brown had served on the Michigan faculty for over 37 years, as a leader in chemical engineering education and research (developing the key textbook for Unit Operations) and then as chairman of the Department of Chemical and Metallurgical Engineering. As dean, he developed the early plans for the engineering laboratories on the North Campus and was key in building industrial support of the College. He was also instrumental in developing new programs such as science engineering and nuclear engineering. Although his tenure as dean was relatively short, he must be regarded as one of the most significant leaders of the College.

George Granger Brown
1951 - 1957



Mortimer Cooley Memorial Laboratory

The first building to be completed on the North Campus was the Cooley Memorial Laboratory in 1953. Much of the classified research associated with Willow Run was conducted in the Cooley Laboratory.

THE PHOENIX PROJECT

One of the first and most important projects for the new North Campus site was the Phoenix Memorial Laboratory. Following the war, there was strong University interest in creating a fitting memorial to honor the 579 Michigan men and women who had fallen in wartime service. It was the students themselves, many of whom were veterans, who proposed that rather than build "a mound of stone, the purpose of which might soon be forgotten", the University instead create a project that would aid mankind in living in a war-free world.

To this end, in May, 1948, the Regents adopted a resolution that "the University of Michigan create a War Memorial Center to explore the ways and means by which the potentialities of atomic energy may become a beneficent influence in the life of man, to be known as the Phoenix Project of the University of Michigan". President Ruthven called the Phoenix project "the most important undertaking in the University's history". Even President Eisenhower highlighted the importance of the Phoenix Project: *"Few causes are more urgent today and more noteworthy of your support. In war or in peace, the atomic research being done at the University of Michigan will strengthen America."* (*Michigan Technic,* December, 1950)

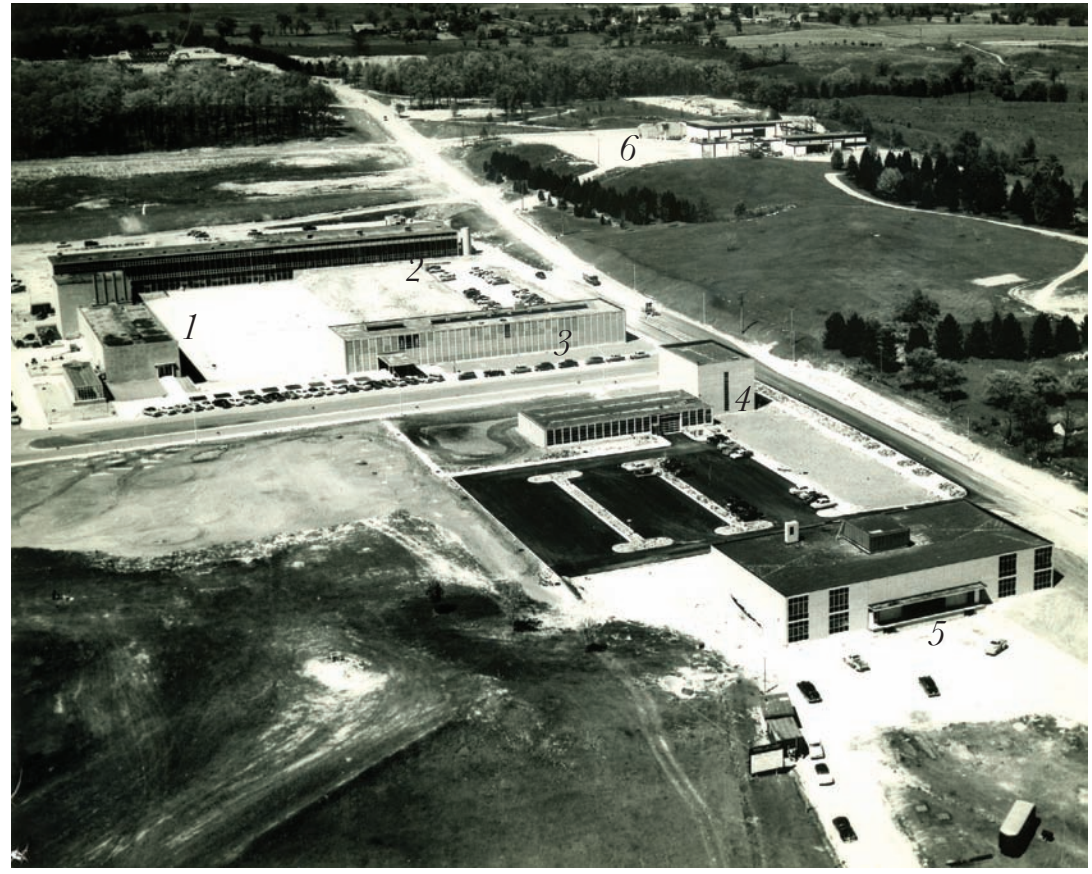
Because the Phoenix Project would utilize the first nuclear reactor to be constructed on a University campus, it was natural to locate its laboratory on the North Campus.

Phoenix Memorial Laboratory

NUCLEAR ENGINEERING

Although many academic programs in the University were involved in the Michigan Memorial Phoenix Project, the College of Engineering had a particular responsibility to develop both instructional and research programs in nuclear energy. The first course in nuclear energy applications was taught in the College of Engineering in 1947, only five years after Enrico Fermi first demonstrated a controlled fission reaction during the Manhattan Project. In 1953 the country's first graduate program in Nuclear Engineering began as an interdepartmental program. The success of this graduate program led to the establishment of the Department of Nuclear Engineering in 1958. The Department granted only graduate degrees until 1965, when the undergraduate program was begun.

In July of 1995 the name was changed to the Department of Nuclear Engineering and Radiological Sciences to more accurately reflect the broad research and teaching activities in the Department.



(1) Ford Nuclear Reactor and Phoenix Laboratory (2) Automotive Engineering Laboratory (3) Cooley Laboratory
(4) Library Annex (5) Printing Services (6) Aeronautical Engineering Wind Tunnels and Propulsion Laboratory

In 1955 the Phoenix Memorial Laboratory was completed. It was the result of the Phoenix Memorial Project. The Ford Nuclear Reactor was completed in 1957. It was the first reactor not in a large fenced-in area and the largest on any campus with a power level of two million watts.

The Automotive Engineering Laboratory, which had previously been in a lean-to next to the Engineering Shops (West Engineering Annex) was relocated in a new North Campus building opened in October of 1957.

The Aeronautical Engineering Department also moved its research activities to the North Campus in 1957. The Aeronautical Engineering Laboratories consisted of two buildings, one of which housed the supersonic and low turbulence wind tunnels, and the other for propulsion research. The College also built a large research laboratory for fluid dynamics research, first known simply as the Fluids Laboratory and later renamed the G. G. Brown Laboratory.

The buildings at the lower right of this photograph were the North Campus Library Annex, and Printing Services.

1950s

The College of Engineering played an important role in other areas of national security during the post-war decades. Following World War II, the University developed laboratories at the site of the old Willow Run Bomber Plant to conduct research on the technologies of radar, infrared, acoustics, seismic, information processing, and navigation and guidance. Many of the faculty members of the College, particularly from the Department of Electrical Engineering, became actively involved in the Willow Run Laboratories' Project Michigan, the effort to develop the technologies of radar, remote sensing, and satellite imaging.

The College of Engineering also played an important role in the nation's space program. Its aeronautical engineering program had long been a national leader, and as the space program began to develop in the 1950s, the College renamed it the Department of Aerospace Engineering and added a number of new fields such as rocket propulsion, orbital mechanics, and space science. A major NASA laboratory in space physics was established, with extensive capabilities in upper atmosphere research and satellite instrumentation.

The Department of Atmospheric and Space Science associated with the Space Physics Research Laboratory became one of the world leaders in space and planetary sciences.

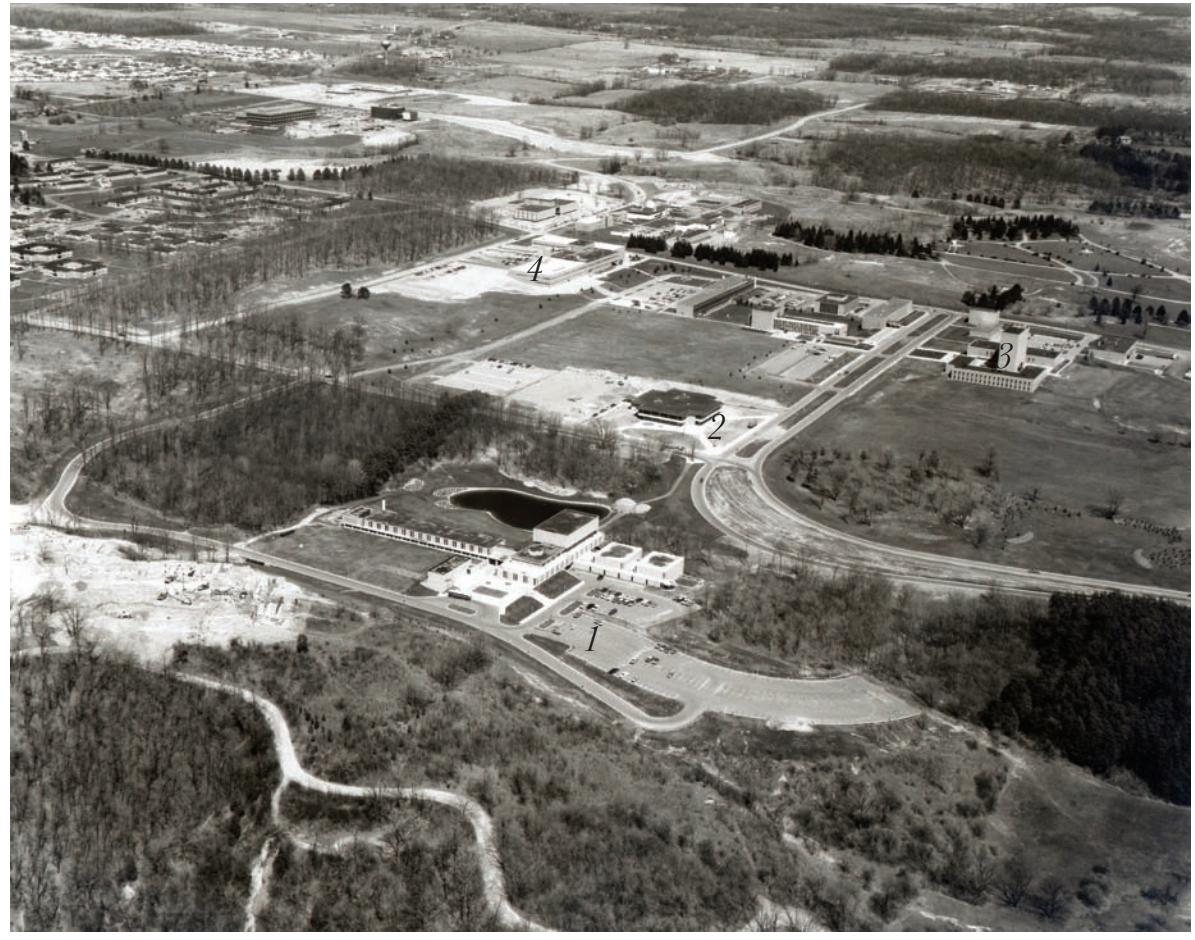
The College's strong reputation in aerospace engineering and space science not only attracted significant funding from NASA but as well the training responsibilities for a number of astronauts. In fact, the entire three-man crew of the Apollo 15 moon mission consisted of Michigan engineering graduates, leading to the establishment of the first University of Michigan Alumni chapter in outer space!

By the end of the 1950s, one could well make the case that the College of Engineering was a world leader in many of the most exotic areas of high technology: nuclear energy, aerospace engineering, space science, and computer engineering. Its graduates spread out to provide leadership in these fields across the nation, around the world–and even into outer space!

Gemini Astronauts
Al Worden and Jim McDivitt

This flag was carried aboard Apollo 15 during the first extended scientific exploration of the moon, July 26 - August 7, 1971.

Apollo 15: The Michigan Mission to the Moon



(1) Music School (2) North Campus Commons (3) Institute of Science and Technology (4) Fluids Laboratory

Although the College of Engineering was the first major University academic unit earmarked for moving to the North Campus, this objective was soon set aside in preference to other University priorities. First, the School of Music was given a major new complex on the North Campus (1964) (its building designed by Eero Saarinen himself), followed soon afterwards by the School of Architecture and Design (and later in 1974, the School of Art when it separated from Architecture). The North Campus Commons (now renamed the Pierpont Commons) (1965) and the Chrysler Center for Continuing Engineering Education (1971) soon followed.

The University also located other major research facilities on the North Campus, including the Cyclotron Laboratory (Physics), the Institute of Science and Technology (1963) (another Saarinen building), and the Highway Safety Research Institute (1965).

CHALLENGES OF THE 1960s & 1970s

Steven Attwood
1957-1964

G. G. Brown's strong leadership was cut short by his premature death. Stephen Attwood, a senior faculty member, former chair of electrical engineering, and acting dean of the College, was named dean of engineering, although he was already 62 at the time. Attwood served in the role for 8 years. It was not a time of significant progress for the College as both national and University priorities began to shift away from science and technology to social programs.

Attwood played another important role in University of Michigan history:

"Perhaps it would be a safe generalization to assume that every student on the campus has at one time or another wondered, whence came the tradition that women must not, and shall not, enter the front door of the Union. From our own private sources the news that it was more or less due to the 1918 president of the now defunct Student Council, Steven S. Attwood. However, when asked to corroborate this fact, the genial, yet reticent, Mr. Attwood professed that memory is at best an uncertain thing and declined to commit himself. We do not think that he will mind being 'exposed', for in fact it obligates us men to the extent of a debt of gratitude." (*Michigan Technic*, October, 1931)

Attwood was followed by Gordon Van Wylen, another strong faculty member and chairman of the Department of Mechanical Engineering. Van Wylen had earned recognition for his work in thermodynamics and authoring a widely used textbook on this subject (co-authored with Richard Sonntag, also later a chair of Mechanical Engineering). As dean, he led the College during a transition period from the high point of the space race to the days of student protests and hostility toward technology. Despite his concerted efforts, the College was able to make only modest progress toward completing its move to the North Campus, with only a small building for the Department of Aerospace Engineering. Van Wylen also presided over a shift in College priorities away from graduate education and research to undergraduate instruction. He stepped down in 1971 to become president of Hope College.

Gordon Van Wylen

The late 1960s and 1970s were a difficult period for engineering education in general and the College of Engineering in particular. The end of the space race, an unpopular war in Vietnam, and an emerging environmental movement all converged to undermine public confidence in technology. The College of Engineering felt these shifting national priorities both through the decline in federal research support and in student interest in engineering careers in the early 1970s (although the corresponding enrollment drop was modest and brief).

The University responded by emphasizing academic programs in areas such as Education, Social Work, Public Health, Dentistry (building the largest dental school in the nation), and Medicine (launching the Replacement Hospital Project as one of the largest construction projects in the history of the state).

But even more significant was the continuation of the 1960s trend that saw University support of the College decline still further. Although the College experienced surging enrollments during the latter years of the 1970s, growing by almost 20% during the decade, the University actually cut its instructional budget by almost one-third. Furthermore, the long-awaited move of the College out of its decaying facilities in West and East Engineering and into new facilities on the North Campus stalled in the face of other University priorities (including major new buildings on the North Campus for the Schools of Music, Art, Architecture and Urban Planning, and even for research units such as the Institute of Science and Technology).

CHALLENGES OF THE 1960s & 1970s

David Ragone
1972-1980

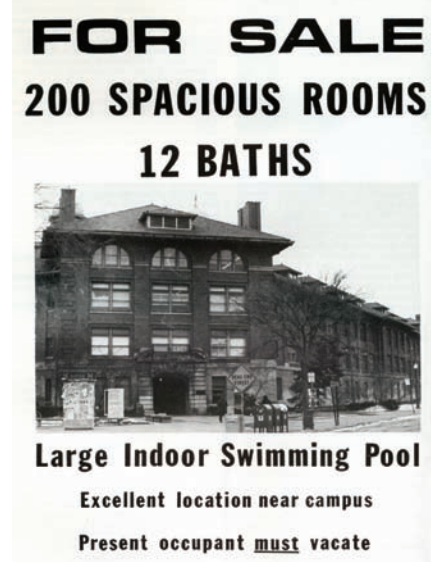
When Dean Gordon Van Wylen resigned to accept the presidency of Hope College, the University of Michigan, after a brief search, named David Ragone, to be the next dean of the College. An M.I.T. graduate, Ragone came to the College as its dean after a brief, two-year period as dean of the Thayer School of Engineering at Dartmouth. Ragone had been a professor of metallurgy at Michigan from 1953 to 1962. After spending several years at General Dynamics, he returned to teaching at Carnegie Mellon University in 1967 before joining Dartmouth in 1970.

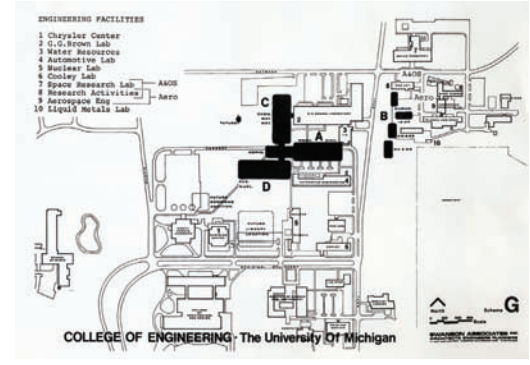
Ragone's philosophy of leadership was stated in an interview with the *Michigan Technic*: "I didn't think drastic changes were in order. As one comes to appreciate more easily from afar, the College of Engineering enjoys and deserves a fine reputation in its present state." (*Michigan Technic*, October, 1972)

Dean Ragone was given the assignment of leading a major private fund-raising campaign that would be combined with a match from state funding to complete the move of the College into a new four-building complex on the North Campus.

In this four-building plan, the largest building, Engineering Building I, would house Mechanical Engineering and Applied Mechanics, Civil Engineering, Industrial and Operations Engineering, Humanities, and the College administration. Engineering Building II would contain Chemical and Metallurgical Engineering. Engineering Building III would be for Electrical and Computer Engineering and Nuclear Engineering, and Engineering Building IV would be for Naval Architecture (with a possible new towing tank on the North Campus).

With great anticipation for the move to North Campus, this ad appeared in the *Technic*, in February, 1974.





Four-Building Plan for Engineering

Unfortunately, the fund-raising campaign was only a modest success because of the weak American economy during the 1970s, and raised only $8 million for facilities, an amount inadequate to trigger the North Campus move. The University complicated the situation by backing away from its earlier commitment to seek state support to push instead the Replacement Hospital Project. With inflation rapidly eroding the funds raised during the campaign, the College decided to direct the entire amount (and then some) to the construction of the Herbert H. Dow Building (Building II) and defer indefinitely any further effort to continue with the rest of the four-building project.

Hence, the College approached the 1980s with only a very modest presence on the North Campus: several research buildings, the Phoenix Laboratory and Institute of Science and Technology (both of which reported to the Vice President for Research), a modest concrete block building for Aerospace Engineering, another small building for the water resources program, and the construction site for the Dow Building.

In 1980 Dean Ragone accepted the presidency of Case-Western Reserve University. For a brief period, Hansford Farris, a Professor of Electrical Engineering, served as interim dean until the appointment of James Duderstadt as the new Dean of Engineering in May of 1981.

James Johnson Duderstadt
1981-1986

Duderstadt received his undergraduate education in electrical engineering at Yale ('64) and his Ph.D. in engineering science and physics from Caltech ('67). After a year as an Atomic Energy Commission Fellow, he accepted an appointment in the Department of Nuclear Engineering at Michigan. Although he was well-known as a leader in nuclear energy research and education, he was not well known to most of the Engineering faculty, since he was one of the few engineering faculty members on North Campus. However, he had served as member or chair of many of the key advisory committees to the University leadership, including the Executive Board of the Graduate School, the advisory committee to the provost, and the powerful Budget Priorities Committee, so he was quite well known to the University Administration.

Duderstadt moved rapidly to build a leadership team comprised of several of the most energetic of the junior faculty of the College including Charles Vest (later to succeed him as dean, then provost, and finally to become president of M.I.T.), Daniel Atkins (also later serving as interim dean of engineering and then founding dean of the School of Information), Scott Fogler (nationally renown for his efforts in chemical engineering education), and Lynn Conway (recruited from Xerox Palo Alto Research Center and a leader in computer engineering and artificial intelligence).

THE TEAM

Charles Vest

Daniel Atkins

Scott Fogler

Lynn Conway

This leadership team, working closely with the department chairs and the faculty, launched an ambitious program to restore the priority of the College of Engineering within the University, reversing the funding decline that had developed during the 1960s and 1970s, and completing the move to the North Campus. The Duderstadt team was committed to improving the quality of the faculty, students, and academic programs of the College, placing a particular emphasis on graduate education and research as key to elevating the reputational rankings of the College. Duderstadt was remarkably successful in achieving all of these goals within the brief span of five years: tripling the base budget of the College; tripling the College's research activity and Ph.D. production; hiring over 120 new faculty members; and boosting the rankings of most of the academic programs of the College into the top five in the nation (although the achievement of this later goal only became evident in the 1990s).

But most significant for this photographic history is the fact that the Duderstadt team managed to move the entire College of Engineering to the North Campus. Here it should be noted that Duderstadt had long regarded the effort to move the College from the Central Campus as a frustrating distraction from what should have been the highest priorities of achieving excellence in its teaching and research activities. However he also concluded, with his colleagues, that the College had no choice but to bring this 30 year saga to an end by completing the move as rapidly as possible, since they saw no possibility of reversing the University decisions of the 1950s to move Engineering to the North Campus.

After a thorough review of the existing plan to move the College into four new buildings, funded from state and private sources, Duderstadt concluded that in the current climate, this plan was clearly both impractical and unworkable. The College's fund-raising efforts of the 1970s had demonstrated how difficult it was to raise gifts for buildings, with only a relatively modest building for the Departments of Chemical Engineering and Materials and Metallurgical Engineering as the result (the Herbert H. Dow Building, then under construction and scheduled for completion in late 1982). Furthermore, the impact of the Replacement Hospital Project on the state's capacity to fund new construction in higher education would be long lasting and likely prevent major new construction until the state's economy improved.

A far more modest plan was proposed to the University administration, based upon the reassignment and renovation of several existing North Campus structures and a single new, state-funded building. This pragmatic, yet workable plan was to result in the move of the entire College of Engineering to the North Campus by 1986 and would become the foundation of what would eventually become one of the finest campuses for engineering education in the nation.

THE MOVE BEGINS.....AT LAST

Industrial and Operations Engineering

A small North Campus building housing the University's research administration was reassigned and renovated to accommodate the Department of Industrial and Operations Engineering (while research administration would be moved to the West Engineering Building).

Herbert H. Dow Building

The Dow Building completed in 1982 housed Chemical Engineering and Materials and Metallurgical Engineering.

A second floor was added to the high bay area of the G.G. Brown Laboratory to accommodate Civil Engineering.

G.G. Brown - Civil Engineering

A library and instructional center (with additional classrooms) was built in the excavated, but uncompleted basement of the Dow Building.

Dow Library and Instructional Center

G.G. Brown - Mechanical Engineering

The G.G. Brown Laboratory was extensively renovated, adding a third floor for offices and renovating its high bay research wing area so that it could accommodate the Department of Mechanical Engineering and Civil Engineering.

Naval Architecture & Marine Engineering

The Department of Naval Architecture and Marine Engineering was moved into a small building adjacent to the old cyclotron laboratory. The towing tank was left in West Engineering on the Central Campus.

Stearns Building

An unused fraternity building adjacent to the North Campus, was renovated to be used to house the Engineering placement offices.

Executing these actions resulted in the relocation of all of the College by 1983 with the exception of Electrical and Computer Engineering. The move also released to the University all of the College's Central Campus space, with the exception of the naval tank in the basement of West Engineering.

The final element of the plan was to persuade the University and then the state to honor their earlier commitments to match the College's private fund-raising effort of the 1970s with a $30 million appropriation for a single new building for the Department of Electrical and Computer Science and Engineering. Duderstadt and Vest were allowed to go to Lansing to lobby the Governor and State Legislature for these funds, which they managed to do successfully.

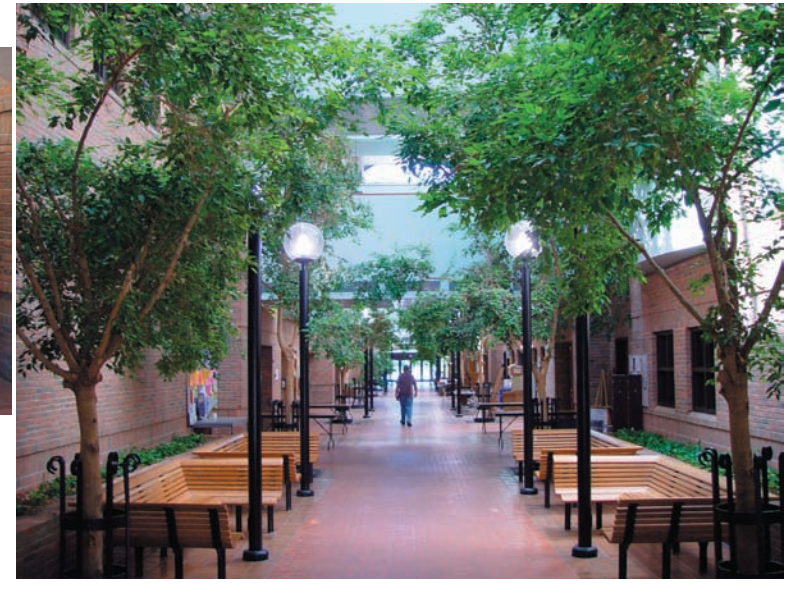
The College administration moved temporarily into the Chrysler Center for Continuing Education (compressing the deans' offices and staff into about one-third the space of the West Engineering offices.

Chrysler Center for Continuing Education

Dean's Office in the Chrysler Center

Groundbreaking for the Electrical Engineering and Computer Science Building
Harold Shapiro, James Blanchard and James Duderstadt

Electrical Engineering and Computer Science Building

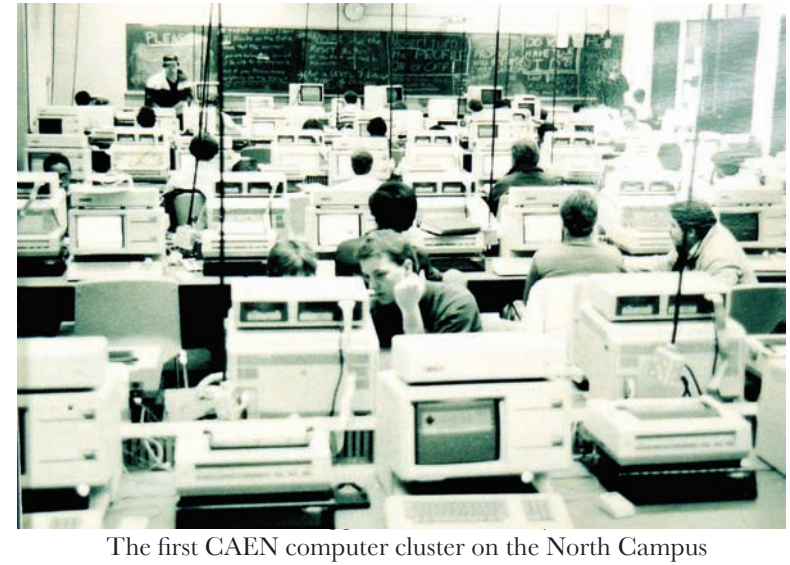


COMPUTING

From slide rule to mainframes, to wireless PDA's, computing has taken many forms in the College of Engineering.

Computer Center in the 1950s

Press Conference announcing CAEN,
the Computer Aided Engineering Network
Bill Podeska, Jim Duderstadt, and Steve Jobs



The first CAEN computer cluster on the North Campus

DEANS

Duderstadt's tenure as Dean of Engineering was relatively short, since he was tapped by President Harold Shapiro to become Provost and Vice-President for Academic Affairs of the University in 1986, just as the new EECS Building was to be dedicated. Charles Vest succeeded him as Dean of Engineering, but also only for a brief period.

Following Harold Shapiro's departure to become president of Princeton, Duderstadt was elected the 11th President of the University, and he quickly selected Vest as his Provost.

The Provost carries his computer downstairs to the President's Office

And hooks it up!

Charles Vest
1986-1988

Charles Vest was a long-standing faculty member in Mechanical Engineering. He served first as associate dean and then as dean of the College. During his brief tenure before being appointed as the University's provost, he completed the North Campus move and recruited some of the College's leading faculty members. In 1990 he was named president of the Massachusetts Institute of Technology.

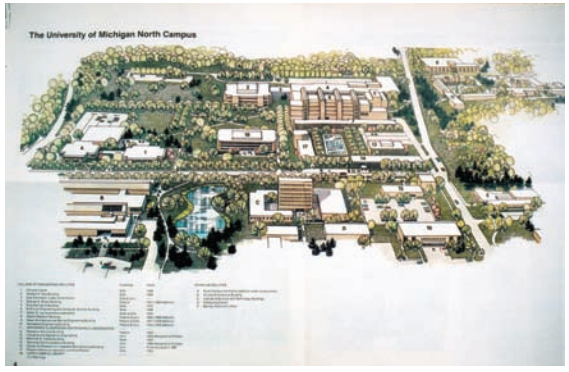
Peter Banks
1989-1994

Peter Banks came to Michigan from Stanford, where he had been a faculty member in electrical engineering and a national leader in remote sensing. He was instrumental in several major efforts of the College, including the completion of the Lurie Engineering Center and Lurie Tower. He left the College to become president of the Environmental Research Institute of Michigan.

Stephen W. Director
1996-

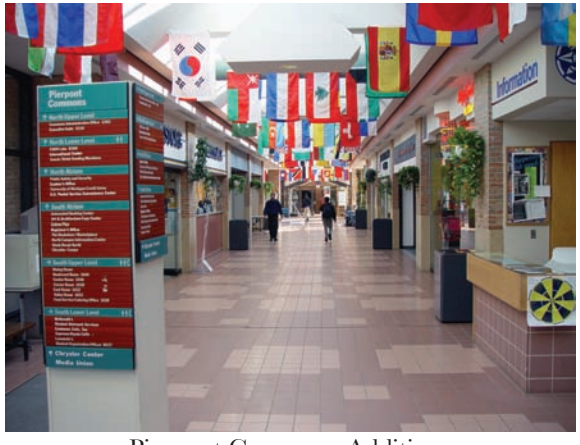
Stephen Director came to the College from a position as dean of engineering at Carnegie Mellon University. Under his leadership, the rankings of the college have continued to climb, with the launch of new programs in biomedical engineering, nanotechnology, and environments systems.

The North Campus site of the College of Engineering continued to evolve during the late 1980s and 1990s. A new master plan was developed following the completion of the College's move in 1986 that identified the need for additional facilities to accommodate the growth in Engineering research and graduate enrollments.



1986 Master Plan - College of Engineering

Chuck Vest was instrumental in building a major addition to the Pierpont Commons that housed an array of student services activities.



Pierpont Commons Addition

The Department of Aerospace Engineering had been housed in an inadequate, concrete block building constructed during the 1970s. Through the efforts of Tom Adamson, chair of the Department of Aerospace Engineering, the College was fortunate to receive a major gift from the Countess Albina DuBuousvouvray to build a new building in memory of her son, François-Xavier Bagnoud, a former student in aerospace who was killed in a helicopter accident on a flying mission in Mali, West Africa during the Paris to Dakar road race. The FXB Building provided superb facilities for this important department.

François-Xavier Bagnoud (FXB) Building

Furthermore, the Countess provided additional funding to commission a major sculpture, "The Wave Field", by Maya Lin.

Maya Lin's Wave Field

There were several other North Campus building projects during this period, including the Industrial Technology Institute and an expansion of the Space Physics Research Laboratory.

Industrial Technology Institute

Space Physics Research Laboratory Addition

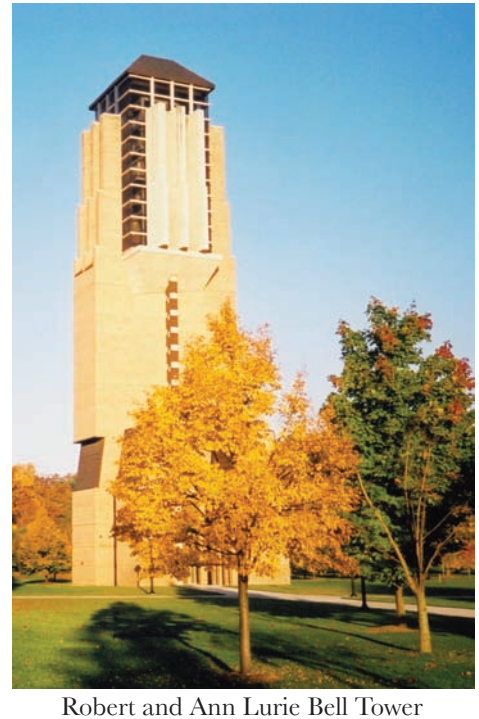
Perhaps the most dramatic new buildings constructed on the North Campus during this period resulted from a unique combination of public and private support: the Media Union, the Lurie Engineering Center, and the Robert and Ann Lurie Tower. As a memorial to her husband, Ann Lurie provided the funds to build both a building for the Engineering administration and a striking bell tower. Charles Moore, one of the foremost American architects of the 20th century, was commissioned to design these structures.

Lurie Engineering Center

The Lurie Engineering Center also provided a significant expansion of the facilities occupied by the Department of Industrial and Operations Engineering.

Industrial and Operations Engineering

Moore had not only been a graduate of the University, but his great-great grandfather had been mayor of Battle Creek and a Regent of the University in the 19th century. When receiving an honorary degree from the University in 1995, Moore noted that it was his ancestor that introduced the resolution to admit the first women students. Tragically, Moore died while completing the design for the Lurie Bell Tower. Recognizing that this was to be his last commission, President Duderstadt decided to invest an additional $2 million of University funds to make certain the tower was built exactly as Moore designed it (including the two structures in front of the tower).



Robert and Ann Lurie Bell Tower

The blending of major works of art with the evolution of the North Campus was due in part to the particular interests of Brad Canale, who directed the College's development efforts.

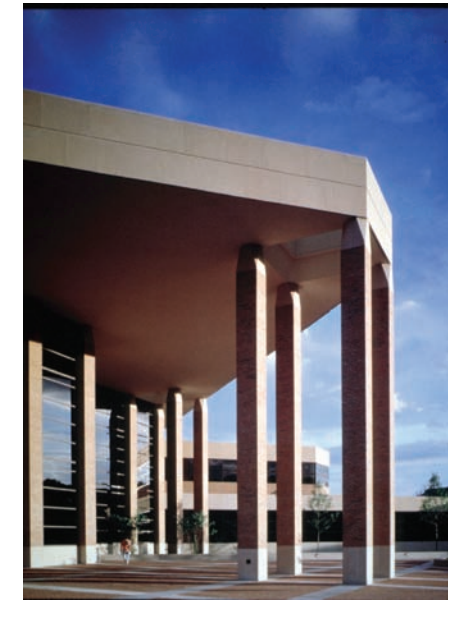
THE MEDIA UNION

Perhaps the most striking project of the 1990s, however, was the Media Union, a visionary library of the future. Since the earliest days of North Campus development, there was a recognized need for a library to house the collections of Engineering, Architecture, Art, and Music. In 1992, President Duderstadt managed to persuade a new governor, John Engler, to provide $50 million to fund the project in a highly flexible fashion that enabled the University to assemble an unusually creative team of North Campus faculty and deans with the charge: "Here is $50 million. Design us a building for a 21st Century university!"

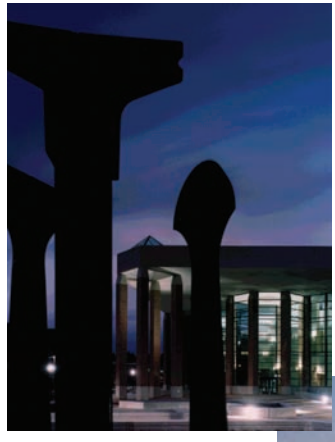
And so they did! The new facility was named the "Media Union", both to symbolize a place for students and faculty to gather similar to the Michigan Union on the Central Campus and to reflect the effort to unite the various North Campus disciplines (Art, Architecture, Music, Engineering) in a multi-media environment. The Media Union was designed to be a testbed for developing, studying, and implementing the new paradigms of the university enabled by information technology. When the Media Union finally opened its doors in 1996, there were probably fewer than a dozen people on the campus that understood what it was. But the students rapidly learned, and within a month it became the most popular facility in the University, operating around the clock, seven days a week, and populated by thousands of students. It was a library, a studio, a sound stage, a virtual reality laboratory…and perhaps the largest concentration of student computing resources in the world.

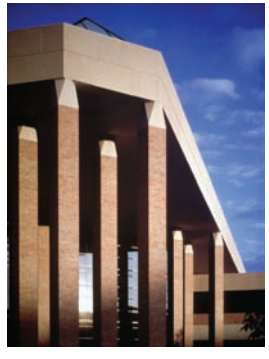
THE MEDIA UNION

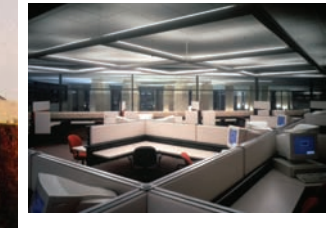
THE MEDIA UNION



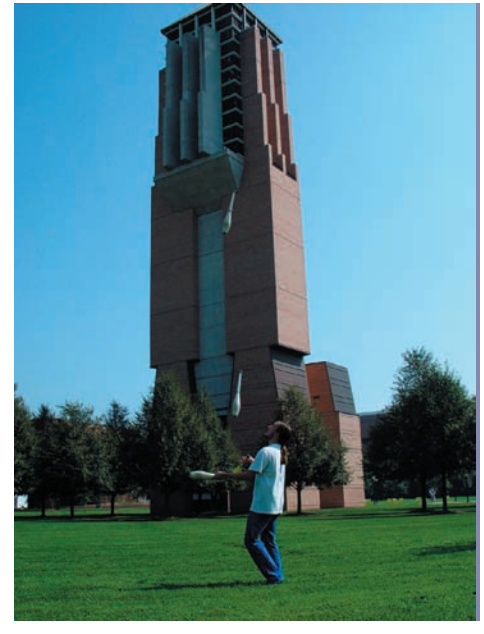
THE MEDIA UNION





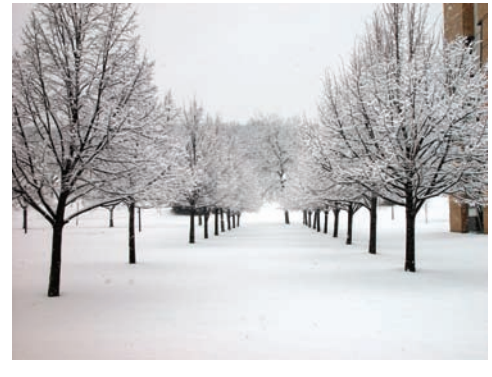


THE ENGINEERING CAMPUS IN FALL

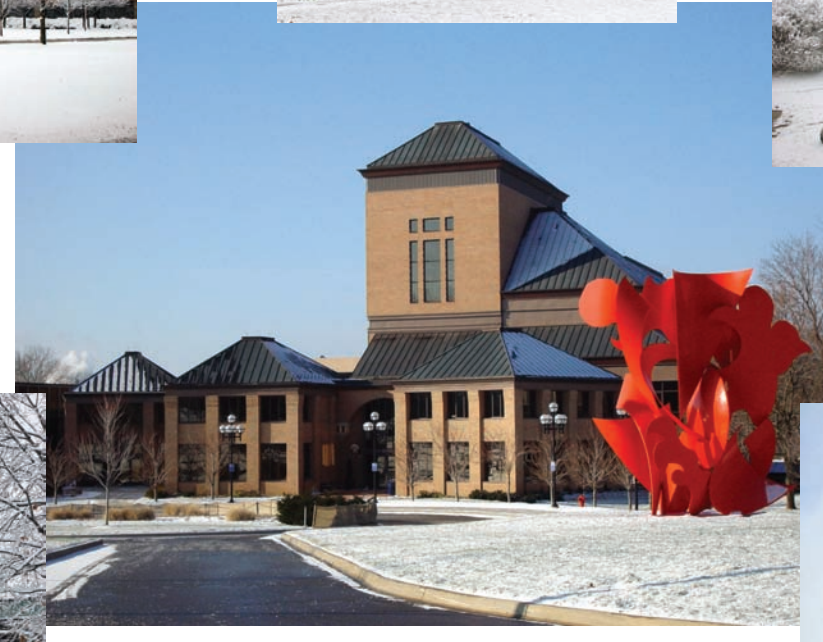


THE ENGINEERING CAMPUS IN FALL

THE ENGINEERING CAMPUS IN WINTER



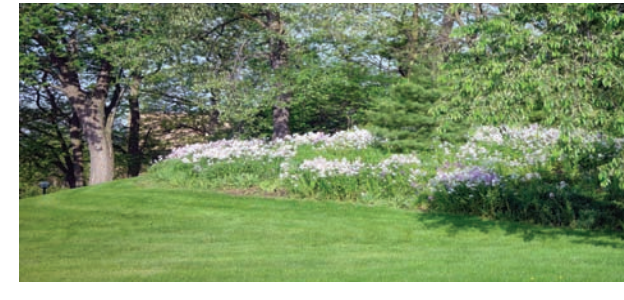
THE ENGINEERING CAMPUS IN WINTER



THE ENGINEERING CAMPUS IN SPRING

THE ENGINEERING CAMPUS IN SPRING

THE ENGINEERING CAMPUS IN SUMMER



THE ENGINEERING CAMPUS IN SUMMER

THE ENGINEERING CAMPUS IN 2003

THE FUTURE

With the completion of the Media Union, the Lurie Engineering Building, and the Lurie Tower in the mid-1990s, the North Campus had taken on a decidedly different look. It was now home to four major schools and over 14,000 students. It made important architectural statements. Its rare blend of creative disciplines began to suggest a new name adopted by several of the deans: "The Renaissance Campus". In many ways, the North Campus had become the laboratory for the University of the 21st Century.

But universities never stand still, and planning for the future of the North Campus continues. One of the most interesting efforts was conducted during the mid-1990s by the four North Campus deans, who conducted a juried competition of designs from the top landscape architects in the nation to arrived at a master plan with the code name of "North Woods".

This plan created a new North-South axis running through the campus, from the forests to the north down to the Huron River to the south. It made extensive use of the evergreen planting that had long provided a distinctive character to the North Campus. The deans forming the judging committee were ecstatic about the design, united in their belief that it would enable the North Campus to make an important architectural statement.

ACKNOWLEDGEMENTS

With gratitude and appreciation to all of those individuals who recorded the history, events, and activities of the University of Michigan.

Russell E. Bidlack, *"The University of Michigan General Library: A history of its beginnings, 1837-1852,"* dissertation, University of Michigan, 1954.

Ruth Bordin, *The University of Michigan: A Pictorial History* (Ann Arbor: University of Michigan Press, 1967).

Mortimer E. Cooley, *Scientific Blacksmith* (Ann Arbor: University of Michigan Press, 1947).

Mortimer Cooley notes on the History of the College of Engineering from its inception to the 1940s (Cooley Files, Bentley Historical Library).

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Wilfred B. Shaw, editor, *The University of Michigan: An Encyclopedic Survey* (Ann Arbor: University of Michigan Press, 1947).

Tappan, Henry P., A Discourse delivered by Henry P. Tappan, D. D. at Ann Arbor, Michigan, on the Occassion of His Inauguration as Chancellor of the University of Michigan, December 21st, 1852. (Detroit: Advertiser Poser Presses, 1852).

The *Michigan Alumnus*

The *Michigan Alumnus* reflects the interests of the University, chronicling its progress and at the same time serving as a medium for news of alumni activities. The magazine was launched as a private enterprise by Alvick Pearson in 1894. He sold it to the Alumni Association in 1898.

The *Michigan Alumnus* was published as a monthly until 1921 when it appeared as a weekly. In 1934 the *Quarterly* was inaugurated, so longer, more solid articles could be published. Editors of the early years included, Shirley Smith, Wilfred Shaw, and T. Hawley Tapping.

Wilfred Shaw's drawings and etchings of Michigan campus scenes and personalities were used in many *Michigan Alumnus Quarterly Reviews* and other publications.

The *Michigan Technic*

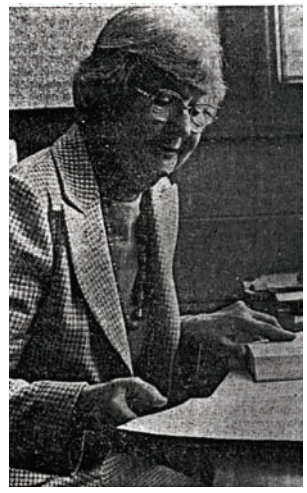
The *Michigan Technic* was first published in 1882, although it was first known as the *"Selected Papers Read Before the Engineering Society of the University of Michigan"*. It was the oldest engineering college magazine in America.

In 1887 the publication was formally given the name of the *Technic*. During the *Technic's* early years, the staff had no faculty supervision, and they had to personally pay for any losses incurred. Later, the College of Engineering gave assistance by paying for a full page advertisement in each issue. In this way each department received publicity once a year. The *Technic* also was supported with profits from publishing the Michigan Engineer's Song Book and from the Slide Rule Ball.

The University of Michigan:
An Encyclopedic Survey

In 1937, to celebrate the centennial of the University of Michigan in Ann Arbor, the Committee on University Archives suggested than an "Encyclopedia" of the University should be compiled to document the history of the institution. Wilfred Shaw was chosen Editor-in-chief. Over two hundred faculty and staff wrote the history and activities of the various divisions of the University, according to a carefully considered format. The resulting four volumes contain the most complete account of the University and its history.

ACKNOWLEDGEMENTS



Ruth Bordin

Ruth Bordin received a B.A. in 1938 and an M.A. in 1940 in history from the University of Minnesota. She was discouraged from pursuing a Ph.D. because at the time it was felt by many that a wife and mother could not also be a scholar. Throughout her life, however, Bordin was actively involved in research, teaching and writing.

From 1957 to 1967, Bordin was a curator at the Michigan Historical Collections, which proceeded the Bentley Historical Library. From 1967-71 and 1975-78 she lectured at Eastern Michigan University.

In 1967 Bordin published *The University of Michigan: A Pictorial History* for the University's Sesquicentennial. Her other major publications included: *Women and Temperance: The Quest for Power and Liberty; Francis Willard: A Biography; Washtenaw County: An Illustrated History; Alice Freeman Palmer: The Evolution of a New Woman, and Women at Michigan.*

Burke A. Hinsdale

Isaac Newton Demmon

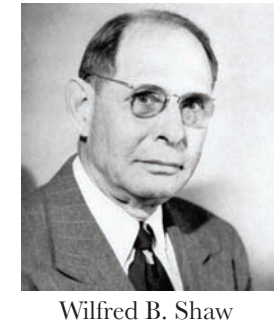
Burke Hinsdale was the first professor of pedagogy at the University of Michigan. His book, *History of the University*, was a scholarly treatise on the rise of state universities, with numerous pictures and biographies of members of the Michigan faculty. The manuscript was not complete at the time of his death and was finished by Professor Isaac Newton Demmon.

Howard Peckham

Howard Peckham received his B.S. in 1931 and his M.S. in 1933 from the University of Michigan. From 1936 until 1945 he served the Clements Library as Curator of Manuscripts and also as Lecturer in Library Science. From 1945 to 1953 Peckham was Director of the Indiana Historical Bureau and Secretary of the Indiana Historical Society. He returned to the University of Michigan in 1953 as Director of the William L. Clements Library and Professor of History. His book, *The Making of the University of Michigan,* was published in 1967.

Shirley W. Smith

Shirley Smith received his Michigan degree in 1897. In 1898 he was an instructor of English in the Department of Engineering. He continued his studies and received an M.S. in 1900. A year later he became Secretary of the Alumni Association, serving until 1904. He was away from campus for four years before returning to became Secretary of the University in 1908. He served as Secretary for twenty-two years under four presidents, Harry Hutchins, Marion Burton, Clarence Cook Little, and Alexander Ruthven. He wrote two biographies: *James Burrill Angell: An American Influence* and *Harry Burns Hutchins and the University of Michigan.*



Wilfred B. Shaw

Wilfred Shaw served as Director of Alumni Relations and Editor of the *Quarterly Review*, from 1907-1929. He wrote *The University of Michigan,* a history of the University from its inception through the administration of President Burton. He also served as editor for *The University of Michigan: An Encyclopedia Survey.*

ACKNOWLEDGEMENTS

While researching the history of the College of Engineering for this publication in the Bentley Library, we discovered that the Dean's records from the Duderstadt years were missing. These files included among other important documents, the move of the College to the North Campus. So, in a typical Duderstadt response, he wrote a book. However, while looking for the documents in the basements, closets, and attics of University Buildings, we came across Mortimer Cooley's notes in an old box in the basement of the FXB Building. The type-written notes covered the administration and curriculum of the College from its inception to the 1940s. On the cover of the notes was a hand written note: Property of Dean's office (*Do not take away*).

Mortimer Cooley

In 1938 Mortimer Cooley returned to Ann Arbor to write the history of the College of Engineering. Having known all but one of the heads of the engineering department since its founding in 1853-54, and having himself been on its faculty 47 years, from 1881 to 1928, Dean Cooley felt that he should write the story. We are grateful that he did!

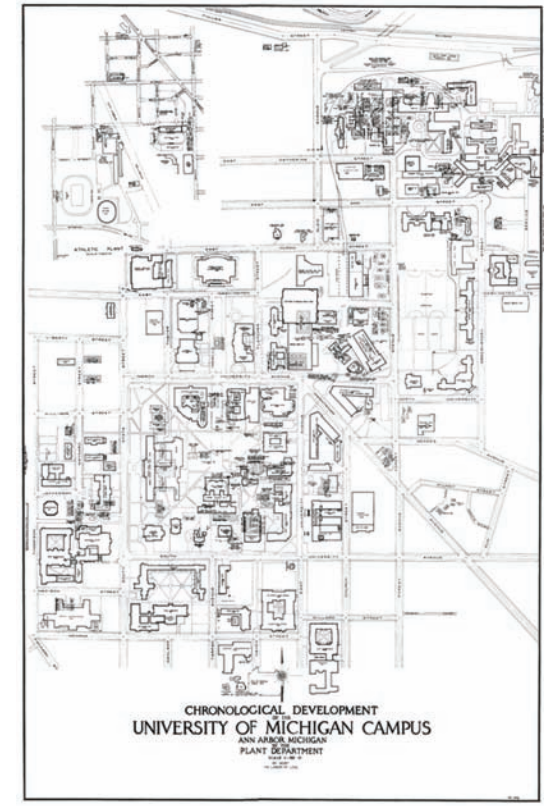
James J. Duderstadt

Jim Duderstadt's book, *On the Move: A Personal History of the College of Engineering in Modern Times*, covers the history of the College of Engineering from WWII to the present.

Myron Mortenson

Myron Mortenson graduated from the University of Michigan with a B.S. in Civil Engineering in 1931. He worked as an engineer in the Plant Department until 1954 when he became Chief Draftsman. Mort's great contribution to the University of Michigan History is his map with footprints of all of the buildings of the University from the beginning to the 1970s.

MORT'S MAP



CHRONOLOGICAL DEVELOPMENT
UNIVERSITY OF MICHIGAN CAMPUS
ANN ARBOR
by the
PLANT DEPARTMENT
by MORT
HIS LABOR OF LOVE

ACKNOWLEDGEMENTS - Photographs

With gratitude and appreciation to all of those individuals who created and preserved the images of the campus, events, and activities of the University of Michigan.

The images that illustrate this story are from the Bentley Historical Collections. Many originally appeared in the *Michigan Alumnus* and the *Michigan Technic.*

The Bentley Library was established in 1935 to serve as the official archives of the University of Michigan and to document the history of the State of Michigan. Our thanks to the Bentley staff for their assistance.

The map of Thomas Jefferson's original sketch of his plan for the Northwest Territory and the map of the Michigan Territory, published by F. Lucas, Baltimore, 1808, are from the Clements Library.

The aerial photo of the 2003 Engineering Campus is coutesy of Laramie Photographic and the College of Engineering Media and Marketing group.

Photos of the Media Union on pages 86-87 were taken by Gary Quesade of Korab Hendrick Blessing for the Dedication of the Media Union.

All other North Campus Photos were taken by the Media Union and the Millennium Project Staff.

George Robert Swain

George Swain received his B.A. in 1897 and his M.A. in 1900 from the University of Michigan. Swain was an educator and a photographer. He taught school and served as principal to several schools. In 1913 Swain returned to the University of Michigan, serving as university photographer until 1849. He accompanied Professor Francis Kelsey of the Latin Department on four trips to Europe as a photographic technician, photographing valuable manuscripts for the university collection.

In 1924 and 1925 Swain was part of a university expedition which conducted excavations at Antioch in Pisidia. He and Professor Kelsey drove university cars from Brussels to Naples and three hundred miles across Asia Minor.

Swain's office was located in the campus library, where he produced negatives for latern slides that were used in conjunction with lectures in fine arts and engineering. Negatives were developed in his home darkroom at 1103 Packard Avenue, since the use of chemicals was forbidden in the library building.

The Papyrus Hunter's Caravan
Dodge and Graham Brothers Cars Presented to the University for the Far East Expedition

Melvin Allison Ivory, another prominent photographer, came to Ann Arbor in the mid-1920's from Lansing, where he had done amateur photo finishing for his father's two drugstores. While an undergraduate at the University of Michigan, Ivory became the official photographer for the *Michigan Alumnus*, *Michiganensian*, and the Bureau of Alumni Relations. Ivory's wife Janet joined him in his work. The Ivory collection in the Bentley dates from the 1920's to the early 1970s. The collection documents Ann Arbor and the University of Michigan. Ivory produced cover art for the Michigan Alumnus. This gave him the opportunity to experiment aesthetically with unusual angles, lighting and subject matter.

Other photographers who contributed to the historical documentation of the University of Michigan include: J. Jefferson Gibson, who photographed the Medical School and compositions of classes, J. Fred Rentschller, who served as apprentice to Gibson until 1890 when he opened his own studio, and Sam Sturgis.

Staff of Photo and Campus Services, circa 1960
(1) Audrey "Audie" Herndon, Customer Representative and Ozalid Operator (2) Robert "Bob" Kalmbach, Darkroom Printer (son of Karl Kalmbach) (3) Lajos "Louis" Martonyi (father of Csaba Martonyi, Ophtalmic Photography (4) Ruth Schroeder, Photographer (5) Carmen Krasteff, Ozalid Operator (6) Fred Andeiegg Supervisor/ Photographer (7) Karloyi "Karl" Kutasi, Photographer (8) Lorene Fitzgerald, Secretary (9) Willie Dobos, Photographer (10) Wilhelmine Hoesl, Laboratory Assistant/ Customer Representative (11) Ilse Wienert, Photostat Operator (12) Karl Kalmbach, Darkroom Printer.

ACKNOWLEDGEMENTS

MICHIGAN COLORS

"The class of 1869 conceived the idea of 'Class Colors.' The entire class met in the old chapel and after a couple of meetings and much discussion, selected for our Class colors 'Maize and Blue,' and subsequently these colors were adopted by following classes and finally by the University." Franklin S. Dewey, class of 1869 (*Michigan Alumnus*, January 4, 1923)

In 1995 Liene Karels researched the "true" Michigan Colors. Liene wrote: *"It is possible the greatest secret of the University of Michigan is that of its colors. In times more poetic but less exact, the precise shades of the University's colors were designated by evocative phrases: "azure blue" and "ripening maize". Interpretations have varied from "the fine blue color of the sky" to "lapis", "ultramarine", and "the blue of the deep sea".* (Letter to the History and Traditions Committee, May 26, 1995)

Reflectance data was captured from an 1912 ribbon. The results gave the following profiles:

Michigan Maize, 1912							
R	G	B		C	M	Y	K
205	132	34		9	28	59	0

Michigan Blue, 1912							
R	G	B		C	M	Y	K
1	15	60		93	76	24	2

Millennium Project Staff

Liene Karels

Mary Miles

Dan Fessahazion

With thanks and gratitude to the Millennium Project Staff, Mary Miles, Dan Fessahazion, and Liene Karels for their assistance in the production of this publication.

To the students that have worked on various projects in the Millennium Project: Jim Carey, Whitney Conrad, Zack Evans, Andy Klesh, Katie Parsons, Peter Wilson, and Greg Wu.

To the staff of Printing Services for their attention, advice and care that they gave to this work.

And to Jim Duderstadt for his encouragement and constant "push" to complete the project.

Jim Duderstadt with his personal trainer Ed Atkins