The story of the evolution of engineering, from a military craft associated with the technology of war to broader civilian applications such as bridge construction, industrial technology, and transportation can be found many places and need not be repeated here. Suffice it to note that the United States lagged behind Europe in the introduction of science and technology into the curriculum of its colleges and universities. The first American school to offer scientific instruction in engineering was West Point in 1802, followed by the Rensselear Polytechnic Institute in 1824, Annapolis in 1845, Harvard (1847) (later spun off as MIT), Dartmouth (1851), and Yale (1852), with Michigan's first courses in 1854.

Actually, engineering education might be dated even earlier at Michigan, since the legislative charter for the University of Michigan adopted in 1837 provided for a professorship in "civil engineering and drawing". However the state legislature provided little funding for the University, and instruction in science and engineering lay dormant until the arrival of Henry Philip Tappan as its president in 1852.

Tappan was a well-known philosopher, committed to building scholarly activity in the University and providing for instruction in both science and technology, and in his inaugural address he proposed "a scientific course parallel to the classical course containing...civil engineering, astronomy with the use of an observatory, and the application of chemistry and other sciences to agriculture and the industrial arts generally."

Upon the recommendation of a faculty member, Erastus O. Haven (later to become Tappan's successor as president of the University), the regents appointed Alexander Winchell as professor of physics and civil engineering. However when Winchell arrived in January, 1854 to begin teaching, it soon became apparent that he was a misfit. His own training had been in law, and his first "engineering course" at Michigan was, in reality, simply an introduction to English composition for engineering students. Furthermore, he had an abrasive personality and was soon involved in disputes both with the chair of Natural Sciences, Silas Douglas, and with 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 finally found a position for Winchell in Natural History (zoology, geology, and botany). However Winchell continued to be a thorn in Tappan's side, and he eventually played a role in conspiring with Haven and the Regents to undermine Tappan's presidency.[i]

Winchell was succeeded first by William Peck, a lieutenant in the Topographical Engineers, and then in 1857 by DeVolson Wood, who is regarded by many as the true founder of engineering education at Michigan. 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 College. Following Wood's departure in 1872, the Department of Engineering was led by three faculty members who would guide its destiny for over three decades: Charles Greene, Joseph Davis, and Charles Dennison. Greene was a professor of civil engineering, educated at Harvard and MIT, who would become the first dean of the College of Engineering in 1895. Davis was also a leading civil engineer who established the University camp in surveying, named Camp Davis in his honor, and located first in northern Michigan and later moved to Jackson Hole, Wyoming, where it continues to exist today as the University's geology camp.

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[i] Henry Philip Tappan was quite an unusual leader for a 19th Century university. Unlike most university presidents of this period, Tappan was a broadly educated philosopher rather than a clergyman by 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 traditions of emphasis on research, graduate education, student autonomy and freedom, and active faculty governance.

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, mathematics) as well as to Tappan's refusal to countersign an order for a microscope he wanted. Working closely with his close 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 "Scholastus" 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 E. O. 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 new Detroit Regent, Levi Bishop, who also began to write hostile anonymous letters concerning Tappan to the

Detroit papers. Most of the other Regents were not initially hostile 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 function of the President and the faculty. Tappan fought against this, noting that not only were these unconstitutional, but that the "president and the faculty are not mere "employees" but are, in fact, THE university. Bishop launched a counter attack, with vicious diatribes against Tappan's "bundle of nonsense". Winchell continued to ingratiate himself with the Regents to lobby against Tappan.

Finally, 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 E. O. 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".

But years later, James Burrill Angel 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!"

The late 19th century was a particularly active time for engineering education across the nation. The Morrill Act of 1863, sometimes known as the Land-Grant Act because of its provision of federal lands to the states for the establishment of public universities, called for the encouragement of instructional programs in “agriculture and the mechanic arts”. By 1880 there were 85 engineering schools in the United States, and by 1918 this number had grown to 126, 46 of which were in land grant colleges.

The key player in the rapid progress of the College of Engineering during the early decades of the 20th Century was Mortimer Cooley, named as Green's successor as dean in 1903. During Cooley's tenure at Michigan both as faculty member and then dean, enrollments in the College grew from less than 30 to more than 1800; the faculty from

two 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 excellently equipped buildings.

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. It has also had a major impact on the evolution of the academic programs of the University. For example, both the programs in architecture and art first were 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 in LS&A in 1928. The University's modern languages programs also trace their beginning to instruction in the College in German and French, later joining 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 participated directly with the School of Forestry and Conservation in developing joint programs in wood technology.

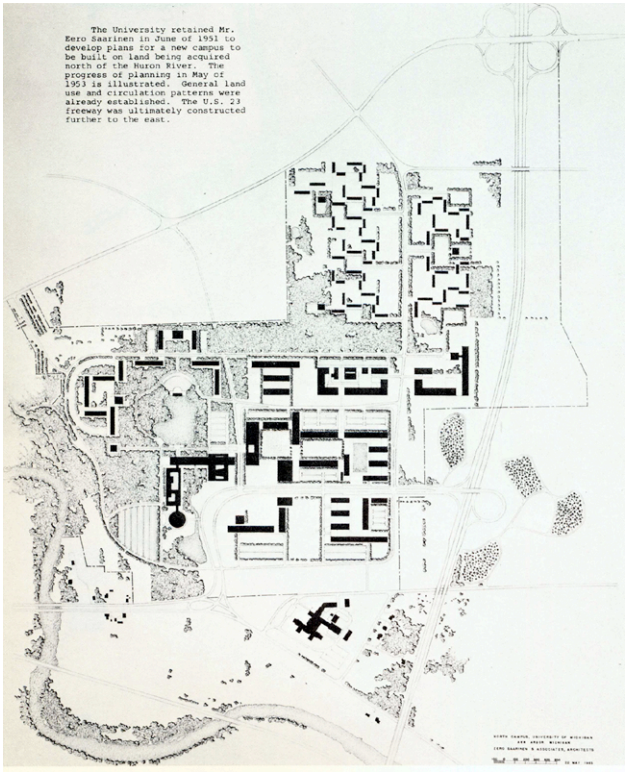
Professor Edward Lesher and his experimental aircraft

Professor Emmett Leith and his holography apparatus

A. D. Moore

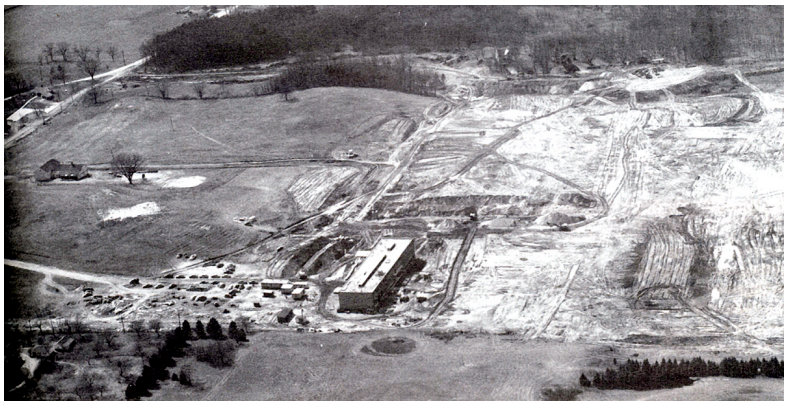
The farmland lying north of the University's Ann Arbor Campus

The noted Finnish architect, Eero Saarinen (director of the Cranbrook Institute and son of the former University faculty member, Eliel Saarinen) was retained in 1951 to develop a master plan for the site[i]. It should be noted that Saarinen had recently completed the design for the General Motors Technical Center in Warren, Michigan, and his design for the University's North Campus bears a striking resemblance to this earlier project:

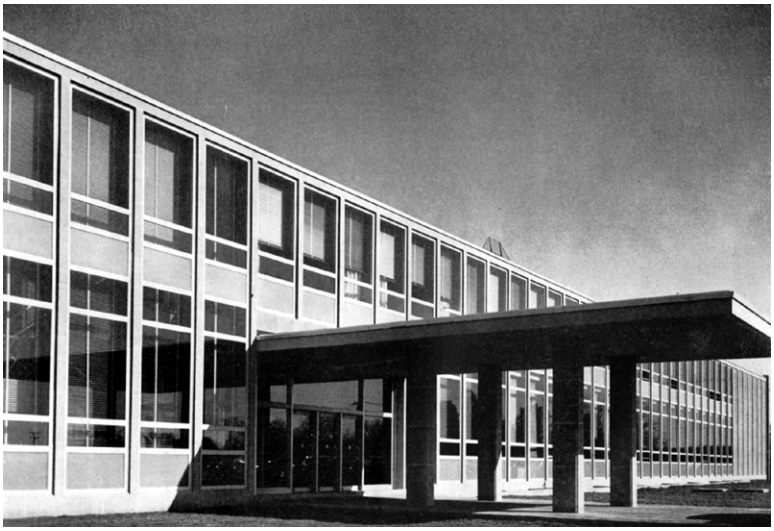


The original Saarinen master plan for the North Campus

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 Michigan Memorial Phoenix Project soon repurposed the site for engineering research and eventually the entire College of Engineering. The first buildings were the Mortimer Cooley Electronics Laboratory (1951) (where much of the classified research associated with Willow Run was conducted), the Phoenix Laboratory (1955), the Automotive Laboratory (1957), the windtunnel and a small laboratory for Aerospace Engineering (1957), and the Fluids Laboratory (1958) (later renamed the G. G. Brown Laboratory):



Early development of the North Campus (the Cooley Laboratory in the foreground)



The Cooley Electronics Laboratory (1951)

As enrollments continued to expand, the University launched a series of planning exercises that considered the relocation of additional academic programs to the North Campus. One plan even envisioned growth of the University to perhaps as many as

100,000 students, with the North Campus becoming one of a chain of campuses, similar in size to the Central Campus, and extending to the northeast of Ann Arbor.

During the 1950s and 1960s the University built a number of large student dormitories and married student housing complexes on the North Campus. However, for most of this period, the Department of Nuclear Engineering was the only academic program located entirely on the North Campus because of the proximity of the Phoenix 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 priorities. First, the School of Music was given a major new complex on the North Campus (1964) (its building designed

Saarinen's School of Music

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 Schools of Architecture and Art

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).

The Institute of Science and Technology

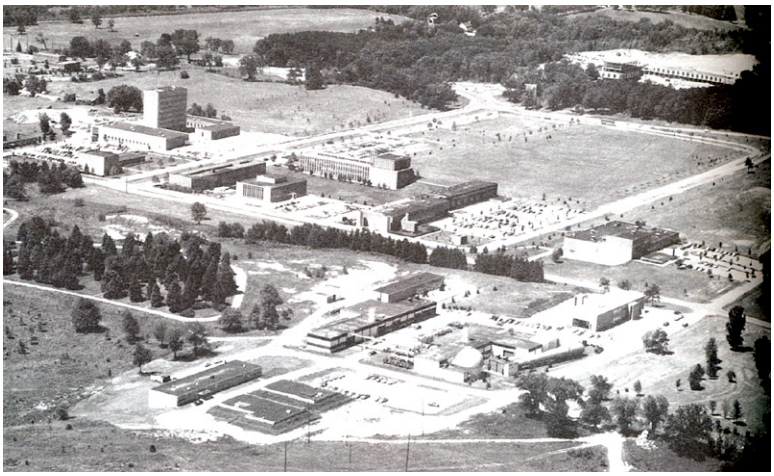
The Highway Safety Research Institute

These latter two research institutes are of interest, since both were strongly opposed by the College of Engineering. They, along with the Phoenix Laboratory, which also fell under University authority, represented an effort by the University's vice-president for research to build major research programs competing directly with the College for both state and federal funding. In each case, they led to significant weakening of the programs in the College associated with these areas.

Perhaps the best illustration that the University had largely turned away from its early plans to move the College of Engineering to the North Campus is provided by the photograph below, taken during the late 1960s:

The North Campus (1970)

The Schools of Architecture, Art, and Music are clearly visible, along with the Institute for Science and Technology. And where is Engineering? This can be seen in yet another photograph, taken at about the same time, which shows only four small buildings: the Cooley Electronics Laboratory, the Automotive Laboratory, the G. G. Brown Laboratory, and a small building for Aerospace Engineering.



Engineering Buildings on the North Campus