THE COLLEGE OF ENGINEERING UNIVERSITY OF KENTUCKY

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By J. WINSTON COLEMAN, JR.

1965 . UNIVERSITY OF KENTUCKY

CENTENNIAL COMMITTEE

At the close of a century of growth the University of Kentucky has arrived at a proper moment for stocktaking. The first hundred years of the institution's history have been colored by the hopes and aspirations of a people who have wished to mature their culture and promote their general welfare. The heart of the University's story, however, lies more with the countless students and faculty members in the past who have given so generously of their talents and lives to develop a struggling agricultural and mechanical college into a university of parts and objectives.

The University of Kentucky has responded to the changing demands of its times. It has created colleges, as trees put out limbs. Indeed, the history of the University is essentially that of its colleges. In these the institution has experienced its frustrations and savored its victories. These several parts have been the University's broadening promises to Kentuckians that it has been ever aware of their educational needs.

The past century, however, has been but a chart to the future for the University of Kentucky. Present faculties and students are no more ambitious than have been their predecessors, but they do have clearer concepts of the educational challenges of a complex age. Because of past sacrifice the second century opens with more assurance of continuing achievement than did the first. It is therefore for a more enlightened future that we now pay tribute to the past.

January I, 1965

THOMAS D. CLARK, *Chairman*
The Centennial Committee

THE COLLEGE OF ENGINEERING
UNIVERSITY OF KENTUCKY

THE COLLEGE OF ENGINEERING at the University of Kentucky had its inception in the passage of an act approved by the Kentucky legislature, February 22, 1865, which accepted the provisions of the Morrill Land-Grant College Act, thereby establishing the Agricultural and Mechanical College of Kentucky, to be located "in the county of Fayette, in or near the city of Lexington."

Six days later, Governor Thomas E. Bramlette approved another statute, which provided for the consolidation of Transylvania University with Kentucky University, a denominational school in Harrodsburg which John B. Bowman had built upon the ruins of Bacon College. Transylvania, the oldest college in the West, had fallen on lean years, and as the buildings of the Mercer County institution had burned the year before, the trustees of Kentucky University moved their assets to Lexington and absorbed the older school. The newly chartered A. & M. College was made a college of Kentucky University, retaining, however, a certain independent status.

By early summer, with the Civil War just over, the buildings of Transylvania were repaired and put jn order, the scattered equipment of that venerable institution was collected and pooled with that of Kentucky University, and on October 2, 1865, the enlarged university began operations "under the most flattering auspices." During the first year, classes were conducted in the College of Science, Literature and Arts, the College of the Bible, and the Academy, with a total enrollment of nearly three

hundred students "from some ten or twelve states of the West and South."

Meanwhile, preparations were being made for the opening of the A. & M. College, the latter division being the forerunner of the College of Engineering. Bowman, who now assumed the title of Regent, began at once to raise the money required by the act which directed that Kentucky University furnish the sum of $100,000, in addition to the funds and properties belonging to Transylvania, with which "to purchase a farm and erect all the necessary buildings and improvements to carry on the operations of an Agricultural and Mechanical College." In three months, Bowman, mainly through his own efforts, collected $112,000; the donations were made largely by the citizens of Lexington and Fayette County.

Bowman now began work toward the building of a great agricultural and mechanical university for the Mississippi Valley. Early in 1866, he purchased the Henry Clay mansion and farm, known as "Ashland," for which he paid $85,000. In addition, for some $40,000 he purchased the farm "Woodlands," the beautiful estate (now Woodland Park) of James Erwin, son-in-law of the Great Commoner, which adjoined Ashland and the town, and included several buildings suitable for immediate use. These two estates comprised a tract of some 433 acres of rich Bluegrass lands on the eastern edge of Lexington, "of as rich and beautiful land as can be found in America."

Regent Bowman reported to the Governor that he had fulfilled the conditions required for the establishment of the A. & M. College, that steps were being taken to employ a faculty, and that the opening of the school awaited only the action of the state in placing at his disposal the proceeds of the sale of the land scrip of 330,000 acres, which had been assigned to Kentucky under the Land-Grant College Act. Unfortunately for the state,

large amounts of this scrip had been thrown upon the market too early, thereby realizing only fifty cents per acre, for a total of about $165,000. This sale was a great disappointment to the friends of the College, who expected at least twice that amount for the endowment. To insure the opening of the College within the specified time, the General Assembly on February 10, 1866, appropriated $20,000 to the Board of Curators of Kentucky University. This was in effect a loan, which could be repaid from the scrip sales, but it was never exercised.

Accordingly, hurried preparations were completed and the Agricultural and Mechanical College of Kentucky opened its doors on the first Monday in October, 1866, with a dozen instructors and, by the end of the academic year, about two hundred students. Regent Bowman, who refused to accept a salary for his services, was offered the use of the Clay mansion for his residence. "Ashland" was chosen as the site of the Mechanical Department, which was partially organized with the erection of several temporary shops and buildings for carpenters, wagonmakers, and blacksmiths. In 1868, the "Ashland Mechanical Works," a large brick building, "sixty by one hundred and forty-three feet, two stories high, with tower three stories," was erected (at 133 Sycamore Road) on the grounds, facing the Clay mansion and several hundred yards to the south. A sizable steam engine was donated to the infant university by Colonel William H. Grainer of Louisville, and a machine shop was added to the department buildings.

The College's mechanical shop was equipped for the testing and manufacturing of agricultural and farming machinery, especially Yost's Climax Reaper and Mower. In addition, students were employed in the College paint shop, in constructing new buildings and repairing old ones, and in manufacturing brooms "under the guidance

and instruction of a Shaker, hired for the purpose." The curriculum of the new school appears to have been more vocational than academic. Here, about one hundred young men were given the opportunity to learn a trade and at the same time earn money to help pay for their education.

At "Woodlands," the old Erwin residence served as quarters for the A. & M. College; it faced downtown Lexington and was parallel with the Richmond Road. The rectangular two-story brick building contained fourteen rooms, "with the front wall of the building convex outward." Octagonal rooms were located at each of the four corners of the house, and in these the professors had their offices. A large room on the second floor, capable of seating one hundred students, served as the chapel and was also used for lectures and recitations. A spacious attic served as an armory and general storeroom. Just south of the stately old residence was a small open field near the Tate's Creek Pike which was used as a drill ground.

Getting off to a good start, the A. & M. College had nearly 225 students enrolled the second year. Courses of instruction, organized as schools, included philosophy, English language and literature, mathematics, chemistry and experimental philosophy, natural history, history, commercial and business practices, military tactics, modern languages, civil engineering and mining, and fine arts. In addition, practical work was required of all students for two hours a day on the farm or in the mechanical shops. Military drill, under the supervision of an army officer, was required of all students, as provided for in the Land-Grant College Act which President Lincoln had signed into law in 1862. Tuition was fixed at $30 per annum, with $5 janitor's fee, both "invariably in advance." Each county or representative district was entitled to send three students to the school free of charge; these were

known as "State" students to distinguish them from persons coming from outside the Commonwealth or those paying the required fees.

When the A. & M. College was put into operation on the Henry Clay and Erwin estates, its faculty was headed by John Augustus Williams, presiding officer and professor of mental and moral philosophy. William W. Boone was director (i.e., shop superintendent) of the Mechanical Department. The School of Civil Engineering and Mining was without instructors in 1866.

Dr. Williams was succeeded in 1868 by the Reverend Joseph D. Pickett, professor of English language and literature, who served as acting presiding officer for one year. In August, 1869, James K. Patterson, a native of Scotland and graduate of Hanover College, became presiding officer of the A. & M. College, having served since 1866 as professor of Latin, political economy, and history. Patterson headed the school until he resigned on January 5, 1910, serving, in all, forty-one years-a tenure longer than that of any other college president in America.

In 1868 and 1869 the enrollment of Kentucky University reached a high point. The number of students in the latter year was 772, of whom some 300 were enrolled in the A. & M. College. The scientific plan, with course offerings in the mechanical arts, surveying, mathematics, and some phases of engineerivg, led to the degree of Bachelor of Science. The apparent first of a succession of heads for the School of Civil Engineering and ;Mining was C. Hale Tebbets, listed in the 1869-70 catalogue as professor of military tactics and civil engineering. Students taking his engineering course received instruction in "descriptive geometry, practical astronomy, geometrical and topographical drawing, lettering, road engineering, use of engineering instruments, leveling, architectural drawing, geology of mining districts, metallurgy, mining

engineering, construction of furnaces, mineralogy and history of mining operations."

The Department of Mechanical Arts seems to have been devoted largely to the manufacturing field, and for the same year the total output of the Ashland Mechanical Works consisted of "22 two-horse wagons, 64 two-horse plows, 43 one-horse plows, 60 cultivators, 2 coal carts, 50 patent trucks, 135 mowers painted and put up, 22 mowers painted and repaired, 8 buggies painted and repaired, 2 rockaways painted and repaired, 1 Omnibus painted and repaired, 35 senior combined Climax machines, 4 light spring wagons, 2 two-horse spring wagons, 1 milk wagon, 5 AA harrows, 6 sets doubletrees, 1 dray, 16 tables for Commercial College, 1 bank counter, 30 benches for Agricultural and Mechanical College, 1 machine for making brooms, 5 hay rakes, 5 patent improved.clothes-horses." In addition to the manufactured equipment, the students made all the necessary tools and machines for the blacksmith shops and farms.

In spite of the College's comparatively large enrollment during this period, its graduates were few. William B. Munson of Astoria, Illinois, received the first degree, Bachelor of Science, conferred by the A. & M. College in June, 1869. Next year his brother, T. Volney Munson, received the second degree. At the end of the 1878 school session only twelve degrees- an average of one a year-had been conferred by the state institution, which during its association with Kentucky University amounted to little more than a junior college.

The connection of the A. & M. College, a state-supported institution, with a private, denominational university brought about much bitter feeling and dissension. Bowman was gradually losing ground, and the College after 1870 was steadily on the downgrade; the combined enrollment in Kentucky University by 1878 had dropped to less

than two hundred students. With the spreading of the quarrels to the whole state, the very existence of the land-grant college for a time was seriously threatened. Abolition of the Academy, the rise of other colleges and schools in the Ohio Valley, and the continuing dissension between Bowman and his opponents in the Christian Church were given as reasons for the diminishing attendance.

As matters continued to grow worse, the Kentucky legislature appointed a committee to investigate the situation. The committee found that the number of students attending the A. & M. College in 1877 was less than seventy, that the Mechanical Department was practically closed, and that the Agricultural Department consisted mainly of ordinary farming and gardening with scarcely any attempt at experimental work or research. They found that adequate buildings had never been provided at "Ashland" or "Woodlands," and that the A. & M. College was far from being any sort of technical college or school.

It remained for the· legislature to take some drastic action. Finally, on March 13, 1878, an act was passed repealing the legislation authorizing the union with Kentucky University and providing that the "said Agricultural and Mechanical College shall forever remain a State institution, free from all ecclesiastical entanglements or control." Thus a new college was created, free from all sectarian or denominational control, to stand on its own legs. Patterson, who earlier had held the title of presiding officer, was now elected first President of the Agricultural and Mechanical College of Kentucky.

It was not, however, an easy matter for the newly detached college to start afresh; it had no campus, buildings, shops, classrooms, or laboratories. All that the new, autonomous institution had was an annual income of

$9,900 from the investments of the land scrip, and the ill will of many ultradenominationalists. The newly separated state college was without a home where its work could be carried on, for the Kentucky Court of Appeals ruled that the A. & M. College had lost the lands and buildings at "Ashland" and "Woodlands" provided for by the money raised some years earlier by Regent Bowman.

Proposals for the permanent location of the new, independent A. & M. College were now being sought. Offers came from Ogden College in Bowling Green and from the city of Lexington. The latter was accepted since, in the opinion of the commissioners, it was the more advantageous. Lexington proposed to give the old fair grounds of fifty-two acres on South Limestone, lying within the bounds of the city, as a site, and $30,000 in bonds for building purposes, which was to be supplemented by $20,000 in bonds given for buildings or lands by Fayette County. The A. & M. College thus was located on the site of the present University of Kentucky campus, by an act of the Kentucky legislature approved February 6, 1880.

As the agreement between Kentucky University and the A. & M. College expired on July 1, 1880, the state school, recognizing that its new quarters could not be prepared for some time, rented its former buildings and grounds at "Ashland" and "Woodlands" for nearly two years longer. The cornerstone of a fine three-story building (Administration) , constructed of brick with stone trimmings and tower, with accommodations for 500 students in the chapel, offices, lecture halls and classrooms, was laid with appropriate ceremonies on October 28, 1880. The construction went on slowly owing to the inability of the College to make its regular payments. Finally, the funds were exhausted, and President Patterson, determined to push on with the construction, pledged his personal savings to support a loan of $7,000. With this new stimulus,

considerable progress was made and the College was able to move into its new quarters on February 13, 1882. The local press commented upon the removal of the "State College cadets," who marched "in formation from the old quarters at Woodlands to the new buildings on the 'College Hill', including Cheapside in their line of march."

After the transfer to the new quarters, the work of the A. & M. College began to take more definite shape. A three-story brick dormitory (White Hall) with accommodations for 90 to 100 students was erected, along with a handsome brick residence for the President, irreverently called "He Pat" by the students. His brother, Professor Walter K. Patterson, in charge of the Academy, was duly dubbed "She Pat," because he had once held the position of assistant matron of the girl's dormitory.

Although the technical name of the state institution was. the "Agricultural and Mechanical College of Kentucky," it had by common consent and usage come to be known as "Kentucky State College" or "State College of Kentucky," and was more often referred to simply as "State College."

About 1882, when the A. & M. College moved to its present location, most of its work was offered in departments which are now included in the College of Arts and Sciences. There were two main divisions of study, the scientific course and the classical course, and most of the departments appeared in both. Engineering and agricultural instruction was included only in the scientific course, while the classical course placed more emphasis on literature, language, and the arts. Before 1880 there had been but one course of study, that leading to the degree of Bachelor of Science. Upon the reorganization provided for in the new charter, the Classical Department was added and the degree of Bachelor of Arts authorized. But the most important extension at this time consisted

of the establishment of the Academy and of the Normal Department.

As in the case of agriculture, the offerings in the fields of engineering were extremely limited in 1882 and for several years afterward. Students who enrolled in the scientific course were offered short courses in civil, mining, and mechanical engineering, with some drawing and shopwork. In the basement of the Main Building (Administration) the Department of Practical Mechanics had shops where students were given the opportunity to learn through actual experience "mechanical drawing, the study and care of tools, work in wood and metals at the bench, the lathe, and the forge." These activities were directed by David A. King, then an instructor.

An engineering course was added to the school's curricula in the fall of 1886, which led to the degree of Civil Engineer (C.E.). This constituted the founding of the College of Engineering insofar as the offering of a degree in engineering was concerned. Classes were taught by Lieutenant F. E. Phelps and Lieutenant Dillard H. Clark, his successor after one year; each bore the title of Professor of Civil, Mechanical, and Mining Engineering and Military Science. Courses in woodworking and the machine shop were now under the direction of Albert R. Crandall, professor of natural history and practical mechanics.

As part of the changes made in the organization of the A. & M. College in 1889, a Department of Engineering was established and William Newbrough, A.M., M.E., was placed in charge with the title of Dean and the rank of professor of civil engineering. The greater part of th work in the new department was in that branch of engineering while mechanical and mining engineering, mechanics, and shopwork received only slight attention.

When Newbrough resigned in November, 1889, Merry L. Pence, an alumnus of the A. & M. College, was made

Dean of the Engineering Department, with the title of professor of civil engineering and physics. Next year the College catalogue referred to the engineering course as a "Course in Civil Engineering." In June, 1890, John Wesley Gunn of Lexington received the degree of Civil Engineer, and thus was the first person to graduate in engineering from the A. & M. College.

A regular Department of Mechanical Engineering was organized in the Agricultural and Mechanical College of Kentucky in June, 1891, when the chair of mechanical engineering was established and the professor chosen. A new engineering building (Mechanical Hall) was begun in the summer of 1891 and completed and occupied by January, 1892. It was commodious and especially well adapted to its purposes, containing shops and equipment "second to none south of the Ohio River"-the estimated cost of which was put at sixty thousand dollars. Mechanical Hall had numerous rooms for recitation and drawing, "a tool room, boiler room, engine room, two machine shops, one for working wood, the other metal," a foundry, a blacksmith shop, and "two large rooms devoted to experimental engineering." For the first time the engineering departments were housed in their own quarters on the campus.

It was during this year that F. Paul Anderson, a young graduate of Purdue University, came to the College as professor of mechanical engineering. Anderson, affectionately known to students and faculty as "Little Paul," received the degree of Bachelor of Mechanical Engineering from the Indiana school in 1890, and was trained primarily to be the superintendent of Studebaker Brothers Manufacturing Company at South Bend, Indiana, where, his father had held that position for more than twenty-five years.

Anderson came to Kentucky to form a department then

untried and unknown in the A. & M. College. Out of his efforts and administration grew the Engineering College, which became more influential and more widely known than any other division in the institution, with an alumni loyal to the school and its ideals. He soon organized a curriculum leading to the degree of Bachelor of Mechanical Engineering (B.M.E.). In the same year James Poyntz Nelson, also a newcomer to the College, was made professor of civil engineering and physics and Dean of the combined departments. Merry L. Pence for a time continued in civil engineering, until a separate Department of Physics was established. Electrical engineering, first mentioned in the College catalogue for 1892-93, seems to have been attached to the Civil Engineering Department. It was not mentioned again until 1898-99, but no courses were offered in the subject.

No other division of the A. & M. College achieved such instantaneous success as did the Department of Mechanical Engineering which Professor Paul Anderson established in 1891. Under his astute and aggressive management the department soon became one of the best known in the College. Frequent open houses to which the public was invited served to make known the work being done by faculty and students, as did exhibitions presented in other parts of the county. James Richard ("Colonel Dick") Johnson received the first degree of Bachelor of Mechanical Engineering (B.M.E.) in 1893. In the same year, F. Paul Anderson's name was listed as Dean of Mechanical Engineering, and James H. Wells was added to the mechanical faculty.

Dean Anderson instituted the practice of requiring the freshman students to take eight hours weekly in the woodworking shop and foundry, and the sophomores to spend six hours weekly in the machine and forge shops, where practical work could be seen and learned under the

OLD MECHANICAL (ANDERSON) HALL

able supervision of "Joe" Dicker, instructor in practical mechanics. Starting in the late 1890s, he conducted the junior and senior students on an annual inspection trip to keep abreast of engineering developments. The junior trip, of five days in early March, visited plants and industrial companies in Cincinnati, Hamilton, and Dayton, Ohio, where the most modern machinery and manufacturing equipment could be seen and studied in actual operation. The senior trip included plants and industrial companies in and around Chicago, Niagara Falls, or Pittsburgh; this covered the fourth week in March, and places visited included telephone plants, electric substations, steel plants, water-intake stations, and manufacturing concerns.

In 1897, Dean Nelson resigned, and his place in the Department of Civil Engineering was taken by John P. Brooks, formerly of Lehigh University. Anderson at this time incorporated electrical engineering into his own department, making it a part of a combined electrical and mechanical engineering course leading to the degree of Bachelor of Mechanical Engineering. Charles R. Studevant was added to the department as assistant in electrical engineering, and the faculty was further enlarged by the addition of John T. Faig, an 1898 alumnus of the College, as assistant in mechanical engineering. Also about this time the two-story brick annex to Mechanical Hall was erected.

In 1895-96 the first organized course in mining engineering was listed in the College catalogue; it appears to have been a part of the civil engineering course, with five hours a week for one-half-term. After the Kentucky Geological Survey by legislative action was moved to the campus in 1898, impetus was given to the creation of the Department of Mining Engineering, established in 1901 with Charles J. Norwood as Dean. The first student to

graduate with the degree of Bachelor of Mining Engineering (B.E.M.) was Robert H. Barclay, in June, 1904.

Thus there developed in the A. & M. College three separate, uncoordinated engineering departments, each offering a bachelor's degree. It is noteworthy that every applicant for this degree was required to submit a suitable thesis on some new design or machine or some original investigation along the lines of his departmental work. Graduate degrees offered were Master of Civil Engineering (C.E.) and Master of Mechanical Engineering (M.E.).

Students in the Department of Civil Engineering started the publication of a technical magazine, *The Transit,* in 1904; it was devoted to the interests of the students and department and continued through 1907. *The Mechanical & Electrical Engineering Record,* first published in 1907 by the students of that department, ran through the school year 1909, presenting certain research and writings done by the students. Alpha Chapter of Tau Beta Pi, a national honorary engineering fraternity, was established on the Kentucky campus April 5, 1902. Membership was based on scholarship, and only students in the last two years of engineering were eligible to join.

An act passed by the Kentucky legislature March 16, 1908, changed the name of the Agricultural and Mechanical College of Kentucky, to "State University, Lexington, Kentucky"-the name of the city and state being a part of the corporate title. The awkwardness of this title caused various unofficial names of the school to be used, as "Kentucky State University" and "State University of Kentucky." To avoid confusion of the newly created "Kentucky State University" with the old denominational Kentucky University on the opposite side of town, the act changed the name of the latter school back to Transylvania University.

In the reorganization of the State University, each of

the three engineering departments became a college. Also in 1909 a new three-story brick Civil Engineering and Physics Building (now Pence Hall) was erected just north of the new Chemistry Building. Here was housed the College of Civil Engineering, whose Dean since 1906 had been Walter E. Rowe, a graduate of the University of Nebraska. Mechanical Hall, now Anderson Hall, with its annex and connecting shops, stood near the new dormitory (Neville Hall) and behind the Administration Building. It was the home of the College of Mechanical and Electrical Engineering. To the rear were the two College of Mining Engineering buildings, one for classroom work (Norwood Hall) and the other for laboratory use. In all, the engineering colleges occupied three and one-half buildings, situated toward the southern edge of the campus on South Limestone Street. About this time the State University offered work leading to the degree of Mining and Metallurgical Engineer, with also a two-year course, and an annual eight weeks' course for practical miners.

At the end of President Patterson's long tenure of forty-one years, he was succeeded by Henry S. Barker, a prominent lawyer and appellate court judge, who assumed the duties of President on January 1, 1911. As a part of the reorganization of the University which was sought soon after his arrival, the Executive Committee, on motion of Judge Richard C. Stoll, March 2, 1911, approved the merger of the Colleges of Civil and Mechanical Engineering; but five days later, at a meeting of the entire Board of Trustees, this action was reversed. The question of consolidating the several colleges of engineering was not raised again for five years. At this time, however, the name of the Mining Engineering College was changed to the College of Mines and Metallurgy.

In June, 1914, Henry J. Jakobe and Oliver W. Smith, Jr., received the first degrees of Bachelor of Metallurgical

Engineering, and the next June the first honorary degree in engineering, D.Eng., was conferred upon David F. Crawford of Pittsburgh. Miss Margaret Ingels in June, 1916, became the first woman to graduate in engineering, with the B.M.E. degree, thereby setting a precedent; since her time, the College of Engineering has graduated thirty-three women, and has five or six enrolled at the present time.

During the night of October 30, 1912, there occurred in the office of Dean F. Paul Anderson in Mechanical Hall a fire which destroyed books, records, and furniture; the total damage was estimated at $3,000. Defective wiring was at first believed to have been the cause, but later investigations indicated arson. After some weeks of investigation, a former student admitted that he had started the fire and implicated a member of the athletic coaching staff. Although the latter was acquitted of any complicity, many persons believed the fire was started to destroy records of the athletic association kept in Anderson's office, for at the time, State University was faced with suspension from the Southern Intercollegiate Athletic Association on the ground that it had played ineligible men on its football teams.

The consolidation of the three engineering colleges, proposed in the first year of Henry Stites Barker's presidency, came up again during the closing years of his tenure, after the reorganization act of March 16, 1916, officially had changed the name of the State University to its present title, "University of Kentucky." After months of investigations, hearings, reports, and sometimes reckless accusations and recriminations on the part of students, "loyal" alumni, and even faculty, the whole matter was passed into the hands of Frank L. McVey, former President of the University of North Dakota, who had been appointed President of the University of Kentucky in 1917.

Dr. McVey considered the matter for a year and then recommended the establishment of the College of Engineering, with F. Paul Anderson as Dean; the Board of Trustees approved this action September 18, 1918.

The new College was more than a mere consolidation of the three older colleges. The curricula were greatly enlarged, new faculty members were added, and seven departments of instruction were organized. Dean Anderson also headed the Department of Mechanical Engineering; Dean Norwood became head of the Department of Mines and Metallurgy. Dean Rowe was retired, and Daniel V. Terrell, who had joined the faculty in 1912, was named head of the Department of Civil Engineering. Other departments and their heads included Electrical Engineering, \\Tilliam E. Freeman; Mechanics of Engineering, Leon K. Frankel; Drawing, Louis E. ("Butch") Noilau; and Practical Mechanics, Joseph Dicker.

To the faculty members of long tenure, such as Thomas J. Barr, William J. ("Speedy") Carrel, John J. Curtis, Alexander M. Wilson, and John S. Horine, were added such men as Ernest A. Bureau, William A. Newman, Charles S. Crouse, Arza L. ("Shorty") Wilhoite, Robert D. Hawkins, John B. ("Jack") Dicker, Stephen T. Saunier, and Charles H. Anderson.

A general revision of the curricula took place. The plan included two years of general study in the fundamental courses and elementary engineering work such as drawing, descriptive geometry, chemistry, physics, shopwork, and surveying. The courses were then divided into the major branches of engineering; each curriculum required about 200 credit hours for graduation. Undergraduate degrees offered by the College of Engineering upon the completion of the prescribed four-year courses were Bachelor of Science in Civil Engineering, Bachelor of Science

in Mining Engineering, and Bachelor of Science in Metallurgical Engineering. Professional degrees-Civil Engineer, Mechanical Engineer, Mining· and Metallurgical Engineer-could be obtained after a year's residence and study at the University of Kentucky, or three year's work in some branch of engineering and the submission of an acceptable thesis.

Beginning with the fall term of 1917, all able-bodied male students at the University were in one of four possible military organizations-the ROTC, the Naval Training Unit, the Enlisted Reserve Corps, or the Students Army Training Corps. Unlike the students in the ROTC, the SATC men were actually in the army; they lived in wooden, two-story barracks constructed by the War Department at the southwest corner of Rose and Winslow (now Euclid) streets; this was known as "Camp Buell." Engineering students continued their classes, drilled an hour or two each day, marched to and from classes, and lived in the company barracks.

Four hundred selective service draftees from Tennessee arrived on the University campus on May 7, 1918, for special courses in the College of Engineering, to be trained in automobile mechanics, radio work, carpentry, blacksmithing, and electrical work. The second detachment came on July 15 and went through the same eight weeks of intensive training. Dean Anderson exercised a close, personal supervision of the technical training courses, which were given by members of the Engineering College faculty. Floral Hall and the Grandstand at the Kentucky Trotting Horse Breeders Association (old Fair Grounds) served as barracks for the trainees, under the command of Major Justin W. Harding, USA. The curriculum, in addition to the technical training, required three hours of drill each day. Something over one thousand men received this vocational training in 1918.

The only permanent building added to the University of Kentucky campus during the war period was a brick shop behind Mechanical Hall (Anderson). Measuring 40 by 267 feet and constructed at a cost of $20,000, it was used for the training of soldiers in carpentry and automobile mechanics.

Henry W. Wendt, president of the Buffalo Forge Company, a friend of Dean Anderson, and an employer of some of the University's engineering graduates, offered in 1921 to donate the equipment necessary for a modern forge shop and furnaces, if the Board of Trustees would provide a suitable building to house it. Wendt's offer was accepted, but it was not until 1926 that the two-story Wendt Shop was started; it was dedicated on May 25, 1927. This building was the north side of the future engineering quadrangle and housed the high-temperature furnaces and metalworking equipment.

Gradually the staff of the College of Engineering was enlarged by the addition of such men as Carter C. Jett, Brinkley Barnett, Perry West, James Richard Johnson (the first B.M.E. graduate), L. S. ("Pat") O'Bannon, and Morris W. Beebe. Professor Charles J. Norwood died in January, 1927, and Thomas J. Barr became head of the Mining Engineering Department and Charles C. Crouse of the Metallurgical Engineering Department. Professor Barr died in August, 1928, and Professor Crouse became head of the recombined Mining and Metallurgical Department.

In 1930 the American Society of Heating and Ventilating Engineers decided to give a gold medal each year to the person who had made the greatest contribution in that field. The society named this award in honor of Dean F. Paul Anderson who, according to its president, had "directed the education of more engineers engaged in the heating and ventilating profession than any other man in

the world." At this time Dean Anderson and several of his colleagues were devoting considerable time in studying the effects of air conditioning and of ultraviolet rays upon plants and animals.

Dean Anderson was an outstanding authority on motive power of railways, and for a number of years he served as Superintendent of Tests for the Southern Railway System. He was a member of the International Jury of Awards with Dr. Steinmetz at the St. Louis Exposition in 1904. Likewise, he was one of the first to experiment with X-rays in America and to use the stereopticon for instruction. For three years he was a member of the engineering division of the National Research Council, and in the late 1920s and early 1930s he took a commanding lead in heating, ventilating, and air conditioning in this country. The American Society of Heating and Ventilating Engineers honored him with its presidency in 1927. Other honors included membership in the American Association for the Advancement of Science and the Royal Society for the Encouragement of Arts.

On April 8, 1934, Dean Anderson died following an operation. "He had a host of friends," said President Frank L. McVey, "and was loved by his students." "Little Paul," one of the leading engineers and educators of the country, had served for forty-three years as professor and Dean of the College of Engineering, which he had built up to be one of the best known and most highly regarded technical schools in America.

Following Anderson's death, William E. Freeman, head of the Electrical Engineering Department was named acting Dean. In December, because of ill health, he decided against accepting the office and was granted a leave of absence. Daniel V. Terrell, head of the Department of Civil Engineering, then became acting Dean.

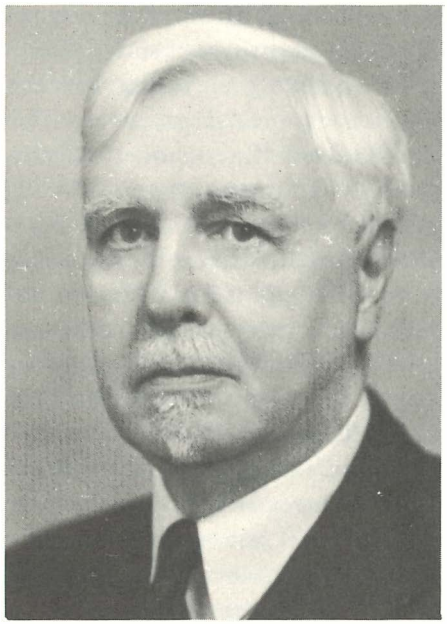
During the year 1934-35, substantial changes were made

in the engineering curricula, and the degree of Architectural Engineer was offered for the first time. In addition, separate degrees were given in mechanical and electrical engineering. The Class of 1936 received the first degrees of Bachelor of Science in Electrical Engineering, and in 1937, J. D. Sutterlin received the first degree of Bachelor of Science in Architectural Engineering. Other curricula developments were reflected in the appointments of Frank J. Cheek, Jr., as professor of sanitary engineering and Andre J. Meyer as professor of aeronautical engineering.

James H. Graham, a 1900 graduate of the Engineering College, was appointed Dean on June 1, 1935; Freeman, after returning from his leave of absence, continued in the position of Assistant Dean. Graham had had a wide experience in the field of engineering, which included the construction of buildings, railroads, highways, and dams. During World War I he served as colonel in the Corps of Engineers of the American Expeditionary Forces and had been in charge of the construction of supply depots, docks, and railways. He was awarded the Distinguished Service Medal and had been given the rank of Officer in the Legion of Honor by the French government.

In the last years of Dean Anderson's administration, the College of Engineering had not kept pace with other universities and colleges. As a result, when a newly created engineering accrediting board made an inspection at the University of Kentucky in 1937, it was not completely satisfied. It noted that there was too much shopwork and that courses in the social sciences were not required. Further, the committee charged, some instructors lacked proper training, equipment was not up to standard, and there was a great deal of "inbreeding of the professors." Low salaries and overloading of the instructors also came in for a share of the criticism.

F. PAUL ANDERSON



JAMES H. GRAHAM

Dean Graham immediately went to work to remedy the situation. By 1940 the College of Engineering had three new buildings, new and better equipment, and completely revamped curricula; as a result, the school was granted full accreditation. In the decade of the 1940s the teaching staff of the Engineering College increased from thirty to fifty-eight. Practically all the shopwork, both woodworking and machine, including the foundry, was eliminated, and emphasis was placed on the study of mathematics and physical sciences.

Since the completion of the Agricultural Engineering Building in 1931, no major construction on the Kentucky campus had been attempted. By the end of 1935, means had been found to finance the construction of three engineering annexes, half of the cost to *qe* covered by a Public Works Administration grant. New space for the College of Engineering was added in three stages. A two-story south wing was extended eastward from the rear of Mechanical Hall; this required the razing of what was known as Dicker Hall (old woodworking shop), a room used primarily for social and recreational purposes. The building of the east wing involved the remodeling of a one-story shop section which had been erected during World War I, its extension at each end, and the addition of a second story. Last to be constructed was the two-story west wing. This required the razing of the old Mechanical and Electrical Engineering Laboratory which had been erected in the late 1890s. The building of the west wing completed a quadrangle, with the Henry W. Wendt Shop forming its north side with Mechanical Hall at its northeast corner. This new construction-the Engineering Quadrangle-completed in 1938-39, made it possible to concentrate all the engineering activities under one roof.

Dean Graham was largely responsible for the improvements and accreditation of the College of Engineering,

but in the process he had replaced some staff members, had shifted others, and had made enemies both inside and outside the University. In addition, he had supervised the design and construction of other new University buildings which had been the subject of much criticism.

Early in 1941, the Wenner-Gren Aeronautical Laboratory was erected on Rose Street, the funds being furnished to build and equip it by the Viking Foundation and the Mawen Motor Company, of which Axel Wenner-Gren was the chief stockholder. The motor company was expected to use the laboratory for experimental purposes and to develop an improved type of internal combustion engine.

On February 7, 1942, the name of Axel Wenner-Gren was included by the State Department on a list of persons whose assets were blocked for the duration of the war. This tended to create suspicion of the Wenner-Gren Laboratory, some believing that spies and traitors were connected with its operations and that somehow it was serving Germany instead of the United States. Both the FBI and the army gave it a clean bill of health, yet the rumors persisted that it was being used for unpatriotic purposes. Because Dean Graham had been instrumental in obtaining money from Wenner-Gren for building and equipping the laboratory, he became the subject of additional criticism. In June, 1944, by mutual agreement the contract with the Mawen Motor Corporation was canceled, and from that time the aeronautical laboratory was operated by the College of Engineering, with Professor Andre J. Meyer in charge.

Earlier, in April, 1941, Dean Graham had accepted a position of "Principal Civil Engineer" in the War Department in Washington and proceeded to make long visits away from the University, leaving Assistant Dean William E. Freeman in charge. After about two years' work for the government, he began to receive $8,000 a

year for his services, in addition to his regular salary from the University of Kentucky. Two Fayette County residents and former students brought suit against Colonel Graham, charging that since April 16, 1941, he had rendered no service to the College of Engineering and asking that he be made to return any money due the University. In effect, the suit sought Dean Graham's resignation from the Engineering College. The plaintiffs lost their case in court when they failed to prove their charges; the decision was later confirmed by the Kentucky Court of Appeals.

In the fall of 1942, with World War II in progress, the University signed a contract to provide instruction for 870 soldiers in the College of Engineering. Additional soldiers arrived from time to time for training in the various branches of engineering. The engineering specialists were housed in the Phoenix Hotel in downtown Lexington. Before this Engineers' Specialist School closed in September, 1943, some 3,174 soldiers had been trained.

Professor Daniel V. Terrell, a 1910 civil engineering gnduate, was made Dean on September 21, 1946, upon the retirement of Colonel Graham. Dean Terrell received national recognition in 1953-1954, when he was elected president of the American Society of Civil Engineers. In the latter year he received the honorary Doctor of Engineering degree from the South Dakota School of Mines and Technology.

To meet current postwar needs, the curricula underwent some marked changes. The mechanical engineering course was revised to include two options: general mechanical engineering and aeronautical engineering. In the Electrical Engineering Department the revision also covered two options: electrical power engineering and communications engineering. With these changes there came the revision and combination of certain courses in engineering to allow for more humanities and social studies.

At the end of World War II there were only 66 undergraduates enrolled in the College of Engineering, but by the winter quarter of 1946, the number of students had grown to 428 undergraduates and four graduate students. The greatest increase in enrollment came durii{g the fall registration in 1946, when 1,280 students enrolled, including fourteen graduate students; this was approximately 19 percent of the total number registered in the University of Kentucky for the fall quarter. Ex-servicemen returning for a bachelor's degree on their G.I. Bill swelled the total enrollment in 1946-47 in the Engineering College to an all-time high of 1,477 students, of which 407 graduated in 1950-the largest class to date.

Honorary fraternities that have come to the Engineering College are Pi Tau Sigma, for mechanical engineers; Eta Kappa Nu, for electrical engineers; Chi Epsilon, for civil engineers; and Alpha Sigma Mu, for metallurgical and mining engineers. There are, in addition to these, Tau Beta Pi, the oldest honorary fraternity on the University of Kentucky campus, and Triangle Fraternity, a social fraternity for engineering students.

Student chapters of the following engineering societies have been established on the Kentucky campus: American Society of Agricultural Engineers; American Society of Civil Engineers; American Institute of Mining and Metallurgical Engineers; American Society of Mechanical Engineers; Institute of Aeronautical Sciences; Institute of Electrical and Electronics Engineers, formed by combining the American Institute of Electrical Engineers, and the Institute of Radio Engineers; and the American Society for Metals.

The College of Engineering is gaining consiqerable recognition for its magazine, *The Kentucky Engineer,* published quarterly by the students and faculty; its first issue came off the press in June, 1939. This periodical

promotes the writing of articles of interest by students, alumni, and faculty of the College and also by professional engineers in Kentucky.

Within the last two decades 1945-1965, the College of Engineering has grown and progressed more than in all the years of its entire existence. Courses have been upgraded and new ones added to keep pace with accreditation and the developing fields in electronic, chemical, mechanical, aeronautical, and nuclear engineering. A number of professors holding the doctorate in engineering from Purdue, M.I.T., Yale, Syracuse, Michigan, Georgia Tech, and other well-known schools have been added to the faculty. Measured by modern standards, the College's well-equipped machine shop with its large number of precision tools and equipment is one of the best in the country and probably the best in the South.

Organization of the Engineering Experiment Station, which coordinates the various research projects and programs carried on by the College of Engineering, and the quarterly publication of some of the projects and research carried out, was established July 1, 1946, with Dean Terrell as director. Other projects established by Dean Terrell were the development of the student scholarship program, the Metallurgical Laboratory, the Coal Research Laboratory, and the Highway Research Laboratory, operated in conjunction with the State Highway Department.

Among the research projects carried on were the study and development of the year-round air conditioning with the heat pump, a study of deionization of thyraton tubes, determination of the basic characteristics of limestone in Kentucky, lubrication oil research and rotovalves, as well as the testing of a number of Pratt & Whitney engines and the measurement of power at ultrahigh frequencies. Jet airplane engines were tested in the Wenner-Gren Laboratory on Rose Street.

Professor E. A. Bureau became ill in the fall of 1950 and gave up the headship of the Department of Electrical Engineering. He was succeeded by Dr. H. Alex Romanowitz, who had received the Doctor of Philosophy degree in electrical engineering from the University of Michigan in 1948. To keep pace with the offerings in the country's better engineering schools, there were added course content in digital computer and analog computer circuit design (employing transistors and semiconductor diodes), molecular engineering (solid, liquid, and gaseous states), solid-state electronics, advanced field theory (electrodynamics), magnetic amplifiers, power system stability and control, advanced circuit analysis and synthesis, and application of advanced mathematics to engineering analysis. Most of this material had been taught only at graduate level in the better universities immediately after the end of World War II. New faculty added to implement this expanding program include Dr. Nathan B. Allison, Dr. Prasad K. Kadaba, and C. Thomas Maney, among others. Plans are in process to establish a doctoral degree program in electrical engineering.

Estel B. Penrod became head of the Mechanical Engineering Department in 1946; he was succeeded by Dr. W. Merle Carter in 1960. Among their fellow faculty members have been Dr. Merl Baker, Dr. Karl 0. Lange, and Orville W. Stewart. The department stands as a modern engineering complex, teaching such courses as nuclear engineering, gas dynamics, motion and time study, power plants, heat transfer and thermodynamics, as well as air conditioning, in which Dean Anderson had pioneered. A strong master's program is offered, and plans are underway for the doctoral degree. At the present time this department is third largest in the College of Engineering.

The Civil Engineering Department, the oldest in the College, was headed by Robert E. Shaver from 1946 to

July, 1957, when David K. Blythe succeeded him. Their associates have included Alvin L. Chambers, Dr. R. A. Lauderdale, Samuel A. Mory, Jr., Clinton K. Hoffman, and E. Everett Elsey. To supplement classroom work and theory, the junior and senior civil engineers attend a four weeks' summer course in a surveying camp, first begun in 1937, at Noble, Kentucky, in the Robinson forest on Buckhorn Creek. This practice continued until 1961, after which the camp has been conducted at various state parks around the Commonwealth.

During 1948, Norwood Hall burned and the Department of Mining and Metallurgical Engineering moved to its present quarters in the Engineering Quadrangle. The department grew rapidly in staff and research equipment. William H. Roll was added to the teaching staff, as were Dr. Roy S. Swift and Dr. Ernest M. Spokes. In 1952, a notable achievement was the authorization of the doctoral program in metallurgy, a longtime ambition of Professor C. S. Crouse. Hal W. Maynor of Lexington was the first to receive the degree, D.Eng., in June, 1952. After Crouse's retirement in 1958, Dr. Richard S. Mateer, a Ph.D. graduate from the University of Pittsburgh, was appointed head of the Department of Mining and Metallurgical Engineering.

For some years there has been an engineering "section" in the agronomy department of the College of Agriculture, under Professor James B. Kelley. In September, 1956, Dr. Drayton T. Kinard was employed to expand the program of fundamental research in a$_{gr}$icultural engineering, and in that year the Board of Trustees approved the granting of a degree, B.S. in Agricultural Engineering, and the planning of a master's de$_{gr}$ee. In September, 1958, Dr. Kinard left the University and Dr. Blaine F. Parker has been in charge since then. A$_{gr}$icultural engineering subjects include farm buildings and equipment, farm

machinery and power, processing and electrification in agriculture, and soil and water conservation. Twenty-three students have so far earned the bachelor's degree, and three have been granted the M.S. degree.

Dr. Karl 0. Lange took over the Wenner-Gren Laboratory's direction in the summer of 1953, and while continuing aircraft engine lubricants testing into 1958, led the laboratory's activities into the fields of parachute technology, aircraft, and aerial reconnaissance instrumentation. This research has continued under U.S. Air Force sponsorship to date, and is concerned with studies of humans and animals as mechanical systems. Related research is conducted in the Laboratory in Behavioral Biomechanics sponsored by the NASA, and now constitutes a major phase of the laboratory's activities.

The Department of Architecture had its beginnings as early as 1927, when the Civil Engineering Department offered courses in the elements of architecture. In 1934, under Dean Graham, the degree of Architectural Engineer was established, and in 1937 and 1938 it was g$_{r}$anted to four men. Failing to attract much attention, the degree was dropped and courses in architecture became an option in civil engineering. Effective July 1, 1960, a five-year program of architecture was approved by the Board of Trustees, with the first student accepted the following September. On July 1, 1964, the School of Architecture was separated from the College of Engineering and placed on an independent basis, with Professor Charles P. Graves as Dean.

Chemical engineering is the newest of the engineering departments at the University of Kentucky. In the fall of 1956 it was initiated by the College of Engineering at the request of the Department of Chemistry and the College of Arts and Sciences. The first graduates received their degrees in August, 1959, and since the program started,

sixty-five men and three women have earned their B.S. degrees in chemical engineering. Dr. Samuel C. Hite, a Ph.D. graduate from Purdue, started the program in February, 1957, and has remained head of the department.

Daniel V. Terrell retired as Dean of the College of Engineering on July 1, 1957, and was succeeded by Robert E. Shaver, native Kentuckian and a 1927 graduate in civil engineering. With a strong and full faculty of some seventy-seven men, most of whom had been recruited during the preceding administration, Dean Shaver began at once to pursue steps toward the complete rebuilding of the curricula and the general upgrading of the academic standards of the College of Engineering. Scholarships in the amount of $74,674 were given to some 131 students, averaging about $540 per year. A new course in nuclear engineering was added, a general introductory course for upperclassmen.

While these and other advances came about, the buildings and equipment of the College left much to be desired. Late in August, 1964, an 80-by-120-foot addition to Mechanical Hall (Anderson) was begun. This necessitated the razing of the old Mechanical Hall, a familiar landmark to graduates and students of other days. The new seven-story engineering building, with a fully equipped basement, is being erected on the site of Mechanical Hall, connected with the Engineering Quadrangle so as to form one central complex. It will house the administration offices, the engineering library, classrooms, and laboratories. With the completion of the $2,225,000 building, the capacity of the College of Engineering will be practically doubled with up-to-date equipment, laboratories, classrooms, and offices.

From the beginning, nearly every graduating class has included individuals who later made their mark in some phase of engineering, manufacturing, or the allied indus-

DANIEL V. TERRELL

ROBERT E. SHAVER

tries. All cannot be listed, nor is it possible to measure the degree of success each attained. William B. Munson, the first graduate of the Agricultural and Mechanical College in 1869, became a railroad president, financier and businessman in Texas. His brother, T. Volney Munson, the school's second graduate (1870), operated a successful nursery business in the same state, published the results of his researches, and received from France in 1888 the Diploma and Decorations of the Legion of Honor *(Chevalier du Merile Agricole).*

Other prominent graduates of the College of Engineering include J. Irvine Lyle and Alexander Thornton Lewis, founders of the Carrier Corporation and early specialists in air conditioning; William Adkins, chief engineer of Firestone Tire & Rubber Co.; Murray Raney, president of Raney Catalysts Chemical Company; Ellis T. Peak, chief engineer of Esso Oil Company, Louisiana; William A. Duncan, Jr., president of Kentucky Utilities Company; J. Stephen Watkins, former Kentucky Highway Commissioner and senior member of Watkins & Associates; Dr. Joseph A. Boyd, president of Radiation Inc., Melbourne, Florida; Robert C. McDowell, president of McDowell-Wellman Company, builders of heavy machinery; James A. Caywood, chief engineer of the Baltimore & Ohio Railroad; L. L. Adams and Howard C. Forman, chief engineers of the Louisville & Nashville Railroad· Samuel M. Cassidy, vice president of Consolidation Coal Company (Ky.); Neal T. McKee, vice president of Locomotive Superheater Company; and Louis Ware, president of International Minerals and Chemical Corporation.

The College has also supplied leadership to a number of other educational institutions, as, for example, James G. Scrugham, Dean of Engineering, University of Nevada, and later governor and United States senator; George F. Blessing, Dean of Engineering, Swarthmore College;

Henry Clay Anderson, Dean of the College of Engineering, University of Michigan; Major General Hugh H. Milton, President of the New Mexico A. & M. College; John T. Faig, President, and Victor E. Muncy, Dean of Engineering, Ohio Mechanics Institute; and Wylie B. Wendt, head of the Civil Engineering Department, Speed Scientific School, University of Louisville. These and numerous other graduates through the years have added to the name of Kentucky's College of Engineering.

Reports from industry show that Kentucky's engineering graduates rank on a par with those of the better known engineering schools throughout the country. Each year the curriculum of the College of Engineering is upgraded to keep pace with the requirements of the Engineers Council for Professional Development, and a considerable number of teachers with doctor's degrees have been added to the engineering faculty. Four departments-Civil, Mechanical, Electrical, Mining and Metallurgical-are fully accredited; two new departments, Chemical and Agricultural Engineering, will, after a few more years of the required probationary operation, be advanced to the approved list. The seventh department, Engineering Mechanics, headed by Dr. Maurice A. Jaswon, offers courses basic to the other departments.

The fall term of 1964-65 for the College of Engineering opened with a faculty consisting of Dean Shaver, seven department chairmen, eleven other professors, twenty-one associate professors, twenty-four assistant professors, nine research associates, and six part-time lecturers, in addition to eleven technicians, superintendents of shops, supervisors, and laboratory assistants. The College now offers instruction leading to the Bachelor of Science in Agricultural Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Mechanical Engineering, Bachelor

of Science in Mining Engineering, Bachelor of Science in Metallurgical Engineering, and Bachelor of Science in Chemical Engineering. Graduate work is offered leading to the Master of Science in Agricultural Engineering, Master of Science in Civil Engineering, Master of Science in Electrical Engineering, Master of Science in Nuclear Engineering, Master of Science in Mechanical Engineering, Master of Science in Mining Engineering, Master of Science in Metallurgical Engineering, together with the Doctor of Engineering degree in Physical Metallurgy. To its own graduates the College of Engineering offers the professional degrees of Chemical Engineer, Civil Engineer, Mechanical Engineer, Electrical Engineer, Metallurgical Engineer, and Mining Engineer.

One hundred years ago the AgTicultural and Mechanical College, the forerunner of the College of Engineering, was established at "Ashland" and "Woodlands." During the long period of operation its growth has been slow and steady, despite many troubles, problems, vicissitudes, and lack of proper financial support. Under the guidance of Deans Anderson, Graham, Terrell, and Shaver the College has managed to grow and prosper and has come to be regarded as one of the foremost engineering institutions in America. To date it has granted a total of 5,649 Bachelor of Science degrees, 576 Master of Science and professional degrees, and 6 Doctor of Engineering degrees. With the beginning of a modern building, the assurance of a strong faculty, and expanding demands for more and better educated engineers, a new era has begun, and the brightest years for the College of Engineering lie ahead.

THE COLLEGE OF ENGINEERING UNIVERSITY OF KENTUCKY