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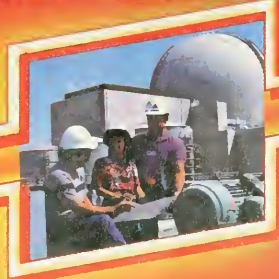
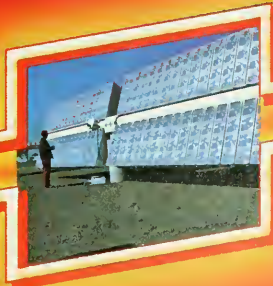
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Illinois**Technograph**

Celebrating 100 years of publication



On the cover: A century has passed since the dawning of the University engineering magazine. Still on the horizon of technology, Technograph now looks back through itself at the history of the magazine, the University, and the country. (graphic by Karen Peters)

The Birth of Illinois Technograph Bob Janssens, Jeff Hamilton, Jeffrey D. Sprandel

The *Technograph* reported the world's technological developments to the members of a growing campus between 1885 and 1910.

Technology Develops America *Michael Lind, Denis Fahey, Lisa Reynolds*

When modern necessities were still experimental prototypes, *Technograph* covered the growth of the United States in the years 1910 to 1935.

Society Changes as Campus Grows *Dee Bartholme, Donna Ryan, Marco Sims*

Whether worldwide or local, new concepts were affecting campus residents from 1935 to 1960. New buildings, new wars, and new theories dotted the important time period.

Progress and Politics *Pete Nelson*

Since 1960, *Technograph* has explored difficult moral problems as well as technical dilemmas, and engineering has provided the groundwork for the next century's conveniences.

Departments

Editorial 5, Tech Teasers 7, Forum 7, Letters 7, Technovisions 18, Technotes 26, Technovations 30, Techprofiles 39 (Techprofiles photos courtesy of T. Naughton, University archives)

Editor *Langdon Alger*
Production Editor *Jim O'Hagan*
Business Manager *Mary Kay Flock*
Photo Editor *Dave Colburn*
Features Editor *Mary McDowell*
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NASA's Project Galileo may provide clues to the origins of the solar system when it explores the planet Jupiter later this decade. Project Galileo is scheduled to be launched from the space shuttle in May 1986 and arrive at the giant planet in August 1988. The mission consists of two spacecraft. One is an orbiter that will circle Jupiter for 20 months. The other is a probe that will plunge into the planet's brightly colored clouds and relay data about the atmosphere. The probe is expected to operate for about 50 minutes before succumbing to temperatures of thousands of degrees, limited battery capacity, and pressures up to 10 times that of Earth's at sea level. Because some scientists believe that Jupiter's atmosphere is a sample of the original material from which stars are formed, the probe's findings will be closely studied. The probe is being built by Hughes Aircraft Company.

The "Eyes of the Eagle" will see even more with the new AN/APG-70 radar, the upgraded radar developed for the U.S. Air Force's F-15 Eagle aircraft. Under the new Multi Staged Improvement Program, the radar's memory increases to 1 million words and its processing speed triples to 14 million operations per second. Other new units in the APG-70 include a programmable signal processor capable of 34 million complex arithmetic operations per second, a multiple bandwidth receiver/exciter, and an analog signal converter. The new radar increases the F-15's superior air-to-air capabilities and provides air-to-ground capabilities for the Air Force's F-15E. The APG-70's air-to-ground requirements will be made by software changes, without sacrificing air superiority capabilities. Hughes builds the radar for the F-15 under contract to McDonnell Douglas.

Artificial intelligence is the focus of a new advanced technology center at Hughes. The facility brings research and development efforts under one roof. Scientists and engineers will work closely with universities throughout the country to develop software and equipment to build the so-called expert systems. Studies will center on knowledge representation, symbolic reasoning and inference, natural language processing, and knowledge acquisition and learning. Technology will be developed for image understanding for geological surveys from space, smart avionics to reduce pilot workload, self-controlled systems, simulation and training, fault diagnosis and maintenance, and manufacturing resource allocation and planning.

The first U.S. facility for making gallium arsenide solar cells on a standard production line is now under construction at Spectrolab, Inc., a Hughes subsidiary. Gallium arsenide cells, which are now being made on a prototype line at Hughes Research Laboratories, will help satellites and spacecraft become more efficient in converting sunlight into electricity. Compared to conventional silicon cells, gallium arsenide cells generate up to 30% more power and operate at much higher temperatures. The first cells are expected to come off the production line midyear. Full-scale mass production at rates to 15,000 cells per year is scheduled for January 1986.

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Editorial

Editorially Contagious

"There seems to be something infectious about being the Editor of the *Technograph*. When you read the old editorials you can't help but observe the symptoms: an intense desire to discuss one's opinion, a hope for reformation, and a belief in the power of the written word. . . . I'm affected with the same [disease], because even today I agree wholeheartedly with much of what the past editors said in their time. . . ." (February, 1985)

"[Women engineers] have the ability and liking for math and science and want to use their knowledge to help others. Instead of complaining that women are oppressed, they are doing something positive like getting an education to qualify them for jobs." (December, 1973)

"The motorists are to be congratulated on not killing a pedestrian on Wright street between classes." (November, 1954)

"... You are a product of your environment. The minute changes that occur in your attitudes every day are not noticeable, but they are there. The engineering curriculum has definitely altered your perceptions of the world around you." (May, 1975)

"The basic idea is true; we need the broadening influence of intimate association with people of all classes, and the experience of competing against men at their own job." (May, 1922)

"Society, through movies, advertising, textbooks, and schooling, has forced men and women to conform to certain roles." (October, 1978)

"Being an engineer or a scientist does not exempt an individual from the necessity of expressing himself in written form. We may joke all we like about

Advanced Remedial Writing for Experts, (Rhetoric 200); however, in the final analysis the pen and the typewriter must be used to complement the slide rule." (October, 1959)

"Let us also remember that unnecessary griping only causes bad feeling and defeats our own purposes." (November, 1946)

"... Engineers must be prepared to deal with the sociological consequences of their work, to consider individuals and social structures as part of the engineering problem. In most engineering problems today, the economic, social, and human factors involved are so numerous and complex that the application of engineering knowledge alone is insufficient." (December, 1966)

"... The ability to get along with people and get them to do what you want them to do is not something to be absorbed by a few geniuses; it is a necessity for modern living." (December, 1948)

"... Gentle reader, *Technograph* is for you." (February, 1978)

"... Many excellent students have only slight ideas of what they can do with their knowledge after they have acquired it. It is really regrettable, for it would be far better to say to a prospective employer, 'Well, I know this and that about the construction features of the Hetch-Hetchy project,' than it would be to say, 'For a cone, I am equal to 3/10 Mr.'." (February, 1931)

"Undoubtedly you have learned through observation that the best way to favorably impress an elephant is to offer him peanuts; he will gobble them up greedily and then grin at you most affably and cause his ears to oscillate in a most waggish manner. An instructor is just like

an elephant. If you offer him exactly the type of answers he desires he will grin at you most delightfully. . . ." (March, 1928)

"Every engineering student has had some experience at some time or another that is of general interest." (November, 1916)

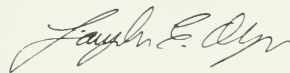
"There is more to becoming an engineer than getting good grades." (March, 1974)

"The main idea then, is to become as effective as possible. The best way to accomplish this is to strive for a balance between the time spent on schoolwork and activities. GET INVOLVED!" (March, 1974)

Copious Gratitude

This issue is an example of what can happen when people follow the March, 1974 advice above. Inexpressible volumes of thanks and congratulations are in order for all the writers, photographers, researchers, business people, and editors who have put in countless hours over the last several months to recreate the past 100 years.

All of us on staff would like to thank Assistant Archivist Bill Maher for allowing us to invade the University Archives so frequently. Special thanks are in order for Bob Chapel, the Archives' Technical Assistant, for all of the searching, patience, and knowledge he donated to us for this issue. Without him and the Archives, this issue would have been next to impossible to produce.



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1. Two identical trains are traveling around the world in opposite directions at the equator. Which will wear out its wheels first, assuming they start at the same time, run at the same speed, and are on different tracks?

2. A certain number is multiplied by three. From this number, four times the number obtained by reversing the digits of the original number is subtracted. This last operation yields the number eight. What was the original number?

3. The following epitaph was found on a gravestone in rural England:

Two grandmothers, with their two granddaughters;

Two husbands with their two wives;
Two fathers, with their two daughters;

Two mothers, with their two sons;
Two maidens, with their two mothers;

Two sisters, with their two brothers.
Yet only six in all lie buried here,
All born legitimate, from incest clear.

How could this situation occur?

4. Write down an arithmetic expression equaling 71 using only the number 4 four times. Any mathematical symbols may be used. There are a number of solutions.

Answers on page 37

The Making of a Tradition

This coming year will mark the one hundredth anniversary of two well-known institutions on the engineering campus—Tau Beta Pi and the *Illinois Technograph*. These organizations have been around for so long you may assume that they have always functioned as they do today. But, like everything else, they had to start somewhere.

Tau Beta Pi originated at Lehigh University in Pennsylvania. In 1885 the liberal arts college supported an honor society, but the engineering school did not. A student at Lehigh felt that it was time for this to change, and sought out faculty and students to back up his idea.

Work progressed rapidly, and the first initiation took place before the semester's end. When the original officers graduated, however, the organization floundered, it looked as though the undertaking would become a complete failure.

Fortunately, someone saw the potential that TBPi held, and was willing to put forth the effort necessary to ensure its perpetuation. The same kind of diligence has formed the *Technograph* into a publication noted nationally for excellence among engineering magazines.

There is nothing magical or lucky about successful projects—behind every one is a group of people who believe that what they are doing will in some way further their profession or help others.

If there is something you would like to see happen, formulate a brief plan. Any one of the many student organizations on campus is a good source for guidance. They are always in search of new ideas, and can provide experience and people to help you.

Who knows, your inspiration may mature into a one hundred year old tradition.

Amy L. Baits
President, Tau Beta Pi

Dear Mr. Alger:

Allow me to introduce myself: My name is Tim Johnston, and I served as Editor of the *Illinois Technograph* during the academic year 1979-80.

I am writing to congratulate you and the current staff of the magazine on achieving the 100th year of publication. As you may know, the first edition of the magazine was published by the Civil Engineers' Club as the *Selected Papers of the Civil Engineers Club* in 1885.

In these modern days, with time measured in nanoseconds, not many things last 100 years. Magazines bloom and die like so many annual flowers; it is great to see that the *Tech* has remained a perennial publication.

I suggest that the *Technograph* celebrate this milestone! (after all, it only comes once a century). Serving as Editor was a special experience for me, and I hold a special place in my heart for the magazine.

Sincerely,
Tim Johnston
BSGE '80

The Birth of *Illinois Technograph*

Technograph began long before most modern conveniences had been invented. Exploring the years between 1885 and 1910 reveals not only the development of an engineering magazine, but also the progress toward today's modern society.

The origins of the *Technograph* date back to January 8, 1883, when the Civil Engineers' Club was formed. This organization served mainly as a discussion ground for both students and faculty in civil engineering. At every meeting members would present papers on topics of interest to civil engineers.

In 1885, two years after the formation of the club, the first skyscraper was constructed, the first motion picture film was manufactured, the first appendectomy was performed, and the first articles were written for what later became the *Illinois Technograph*. The first daily rail service to the Pacific was two years away, the first American automobile had ten years



Professor Arthur Newell Talbot served as faculty advisor for the first edition of the engineering magazine in 1885. A former student at the University, Talbot found national prestige for his pioneering work in civil engineering. (1881 photo by Thomas Naughton)

to wait before its manufacture, and the first radio receiver would not be built for another fifteen years. Engineering was still in its infancy; most engineers designed railroads, bridges, buildings, or steam engines.

A collection of the best papers presented to the Civil Engineers' Club in the 1885-86 and 1886-87 school years was published in 1887. The purpose of the publication was "to place in permanent form some of the papers read at the meetings, and also to extend the influence of the society." With that purpose in mind, the club decided to publish a similar volume every year entirely funded by advertising and subscriptions.

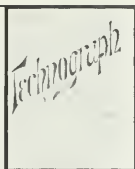
Professor Arthur Newell Talbot, one of the most respected engineers of his age, served as faculty chairman of the new publication. He also contributed many articles to the first issues. Talbot

had graduated from the College in 1881 with a ninety-eight percent average. In 1885 he became a member of the College's civil engineering department. During his illustrious career he served as head of not only the municipal and sanitary engineering department but also the theoretical and applied mechanics department. In 1918, he was elected as president of The American Society of Civil Engineers, and in 1938, the College of Engineering renamed the old Materials Testing Laboratory in his honor. Under the leadership of such a successful man, the publication became an instant success.

The first few issues of *The Selected Papers of the Civil Engineers' Club* contained a multitude of high quality articles, many of which were reprinted in other technical publications. Among the interesting articles in volume one were: "Notes on Mountain Railroad Location," the first of several by Talbot, and "Hints to Students on the Education of an Engineer" by professor I. O. Baker. The latter article hailed the benefits of a "general" in addition to a "technical" education and warned students not to study engineering solely for financial gain.

A significant article by Talbot was published in the second volume of *Selected Papers*. It presented a formula for calculating the cross-sectional area of a body of water for bridges and culverts. The formula, which still bears Talbot's name, became widely used by civil engineers, and the article became a standard engineering reference work.

Other articles of interest in the first volumes included "Rapid Computation," in which J. B. Tschamer, of the class of 1890, prepared the most comprehensive



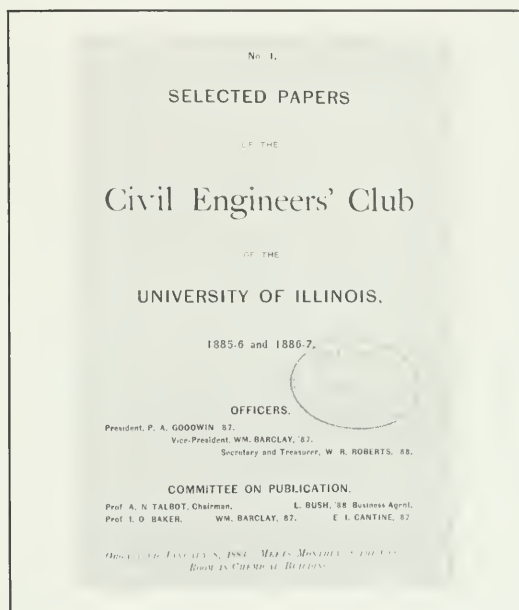
study on the adhesion of drift bolts; in "An Ideal System of Numbers" Talbot argued that a duodecimal—base twelve—system of numbers would be much easier to use than the present decimal system.

In 1890, the Mechanical Engineering Society joined the Civil Engineers' Club in publishing volume five of the magazine. Since the old name was now inappropriate, the publication was renamed *The Illinois Technograph*. The Architects' Club was formed on January 23, 1891, and soon it also became part of the *Technograph*. The focus of the magazine had become more general: to serve the entire engineering community of the University.

Photography made its *Technograph* debut in the 1891-1892 issue. Photographs of civil engineering instruments, the iron workshop, the dynamo room, and the drawing room were among those published. Also introduced into the magazine in this volume was the first advertisement—for the College. The humble ad boasted courses in architecture plus mechanical, electrical, civil, and mining engineering. At the time of the advertisement, engineering was one of four colleges at the University and had a faculty consisting of seventeen professors and instructors, and a class of nearly 300 students.

In 1893, the College erected a new engineering building designed by a graduate of the University, G. W. Bullard of Tacoma, Washington. The new building would house the electrical, civil, physics, and mechanical engineering laboratories, and the architects' blueprint room. The building, which was later named Engineering Hall, is the oldest remaining building on the engineering campus.

An article in the 1896-97 issue featured a description of the University Library, which is presently Alfeld Hall. Built in modern Romanesque style, the library was marked by a tower standing



The first engineering magazine featured technical reports by prestigious faculty members. The University of Wisconsin used several early editions as textbooks. In 1890, when other engineering societies joined civil engineering in the magazine's production, the publication was re-named the *Illinois Technograph*. (Photo courtesy of University archives)

132 feet high, mahogany doors, and a marble entrance hall. Designed by University architecture Professor N. Clifford Richer and Associate Professor James M. White, the new library contained ample space to house the University administrative offices and museums.

Later articles featured descriptions of a variety of technical achievements, ranging from the increasing importance of elevators to the development of sewage systems for office buildings.

An 1899 article described the Society of Professional Engineers. Formed in 1852, the society had 2,124 members when the article was written. A professional engineer, architect, or marine architect who was over thirty years old, had actively practiced his profession for

ten years, and had directed or designed engineering works for at least five years could apply. Admission was based on these requirements and on a secret ballot of current members.

At the beginning of the twentieth century, a *Technograph* article described one of the greatest engineering projects in history: the construction of the Panama Canal. After spending three years studying possible routes of the canal, the Isthmian Canal Commission (ICC) finally narrowed the possibilities to two: the Panama route, and the Nicaragua route. The ICC eventually selected the Panama route because of its shorter distance, the existence of a railroad across Panama, fewer necessary locks, and a lower cost of operation. The

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construction of the canal required the employment of 15,000 men, the damming of a river, a battle against malaria, and the excavation of ninety-five million cubic yards of earth.

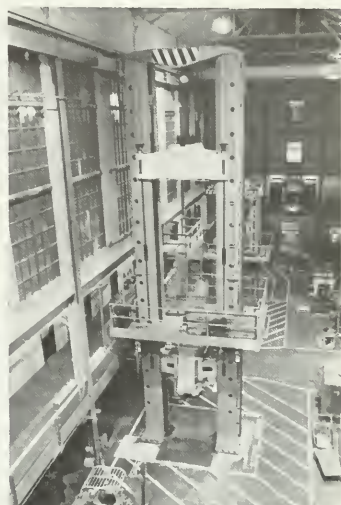
The technological advance which most affected the engineering profession during this time period was the increased use of electricity. Many articles pertaining to this new field of science appeared in the *Technograph*. Several of them discussed the development of wireless telegraphy. One article described underground telephone lines, and another demonstrated the possibility of transmitting both power and telephone signals over the same wires. The popularity of electric lighting continued to increase, and articles were written about the decorative lighting techniques employed at the World's Fairs in Chicago and St. Louis, and about the uses of electrical lighting in theatrical productions.

Many advances were shedding light on the University as well; the College was growing. A building for the laboratory of applied mechanics was constructed to replace the old building which was des-

troyed by fire in 1900. A new workshop was completed in 1902 on the site of the old military building, also destroyed by fire in 1900. The Chemistry Annex was ready for occupancy in 1902. Other buildings completed during this period were the Agriculture Building and a men's gymnasium.

A mine rescue station was opened in 1906 by the United States and Illinois Geological Surveys and the University. The station was designed to demonstrate modern mine rescue tactics and equipment to those involved in the coal mining industry. The equipment at the station was also available for actual use at mine fires or explosions. It was used at two explosions and four fires during the first year of the station's existence. This station and several others that were established soon after made Illinois the first state to adopt modern mine rescue tactics.

During this time the engineering profession was specializing. The traditional classifications were no longer sufficient to



describe an engineer's work. Along with increased specialization came a greater demand for engineers. In the three years between 1899 and 1902 the number of students enrolled in the College doubled. This crowding resulted in expansion of the engineering departments' facilities, including the construction of new buildings and the movement of the physics department from Engineering Hall to its own building.

In its first twenty-five years, *Technograph* grew along with the College and the engineering profession. Starting as a collection of papers presented at club meetings, *Illinois Technograph* became the voice of the entire University engineering community. ■

Technology Develops America

1910-1935: A period of discovery, adjustment, and exponential growth.

In many ways, the world as it is known today grew its roots between 1911 and 1935. Many items now taken for granted were first reported in the *Illinois Technograph* during this period. The University campus changed and developed, while the *Technograph* also evolved into something resembling its present format.

Many of the "new developments" reported in the *Technograph* and other magazines several generations ago have become commonplace. Air conditioning began to emerge as an alternative to folded-paper fans in the early thirties. "Martha Washington," a dining car put into service on the B & O Railroad in 1930, was the first to offer the comfort of "conditioned air" to its passengers. Soon after, construction began on Radio City, a massive building housing RCA headquarters, NBC offices and 30 broadcast studios. Without air conditioning, the many windowless portions of the building would have been useless. Improvements in technology prompted market analysts to predict that every building on earth would use air conditioning.

Television is another development that was reported early in the *Illinois Technograph* which has permeated today's society. In 1985 many people take large screen color televisions for granted; but few TV rerun connoisseurs have any idea how long the television has existed. The Chicago Daily News obtained the first television broadcast license in 1929, allowing them to transmit pictures, although they were quite inferior by today's standards.

The poor quality was due largely to the technology at the time. Back then, a bright light shone through a spinning disk containing a spiral of holes. The scanning light beam reflected off the person being televised and was converted to electrical impulses by a phototube. After transmission over conventional radio stations, a receiver with a similar spinning disk and a neon glow tube produced a picture typically four inches by five inches in size. Even with such primitive technology, a three or four foot square picture was often obtained by adding projection lenses.

Today, communication by light waves via fiber optics is heralded as the newest method to relieve communications bottlenecks. Nevertheless, the transmittance of telephone conversations through lightwaves is not an entirely new technology. In 1932 for instance, scientists shattered the six mile record for transmitting voice with a light beam. An electric arc lamp with a

two-foot diameter reflector transmitted voice-encoded light to a phototube mounted on a three-foot reflector twenty-two miles away.

The phototube found work in the streets as well as in communications. Intersections of major thoroughfares and minor streets have caused special traffic control problems since the introduction of the automobile. Traffic lights maintained adequate order at such intersections, but frequently many cars had to wait for a red light on the major street while the minor street was deserted. Successful experiments in the early thirties used phototubes to detect autos on the sidestreets and change the light when necessary. Maintenance problems occurred, but the phototubes were a viable solution to the frustrating crossroads dilemma.

Besides reporting on traffic solutions, the *Technograph* also revealed the discovery of new energy alternatives. In the Chicago area, a seven-room house in the forest preserves was insulated and heated with gas, instead of the usual wood. During the 1925-1926 heating season, the fuel bill was \$110. Without the changes, it would have cost \$350.

An energy alternative often used today is solar power; sunlight was converted directly into electricity for the first time in 1935. Four iron disks covered with a thin layer of selenium produced enough electricity to drive a motor the size of a little finger.

Despite the Depression, the desire to break technological records remained. Transport over land reached a record speed of 276.816 miles per hour. Transport over water improved with the construction of the San Francisco-Oakland Bay Bridge. This 8.25 mile long suspension bridge was the world's deepest water bridge and would carry 45 million people each year. The Empire State building, for years the tallest in the world, was built during this time.

With the construction of taller buildings, elevators consumed many valuable square feet of floor space. To make skyscrapers more economical, one idea proposed that two or more elevators share the same shaft. Operating each on a regular schedule and using three separate safety devices prevented collisions.

Lighter-than-air transport, such as the Hindenburg, was another idea which never succeeded. Despite elegant cabins and grand plans for regular trans-oceanic flights, the airships were eventually phased out.

Problems created by technology began to expose themselves and seek solutions during this time. Experts warned about the danger of carbon monoxide as early as 1935. One million cars traveled the roads emitting hazardous levels of CO, impairing the judgement and endangering the lives of their occupants.

Traffic control also began to attract attention. Few city planners of the day recognized the need to provide public parking spaces. Often their solution to traffic jams was to add traffic



Since its inception in the early 1930's, fiber optics technology has found a wide spectrum of applications ranging from communications to medicine. (Photo by Dave Colburn)

lights, causing more complications. Since the left-turn arrow had not yet been imagined, "no left turn" signs were used to eliminate the problem of waiting for cars wishing to turn left.

Due to an increase in road construction and increased auto traffic, there was a need for standardized regulatory signs in 1925. Each state had a different system, causing much confusion when traveling interstate. There were several proposed codes for marking warning signs. One system which involved shapes and symbols, the Mississippi Valley Highway Association's proposal, was gaining favor and is in use today.

With traffic and construction projects came noise to the cities. One solution which reduced construction noise was arc welding. According to the January, 1930 *Technograph*, "The application of electric arc welding to structural work continued, during 1929, to be the activity arousing greatest interest, both

popular and technical." While this may seem silly when compared with the amazing developments occurring today, the reduction in noise, savings in weight and automation of the building process improved upon old methods of using only rivets.

Economic problems in the early thirties were the most serious in the history of the United States. Engineers were one group of scapegoats during the Depression. Society attacked the engineering community for reducing employment and in general ruining the economy. Railroads, products of engineering, suffered like other businesses. Not only did the Depression strain them, but new technologies threatened their strangulation. Highways were usable by everyone and generally cheaper for all, the pipelines were more efficient than railroad tank cars, and railroads could never surpass planes in terms of speed.

New forms of entertainment revolutionized leisure time. "The talkies" combined the senses of sight and sound in the theater. New recording processes, evolved from experiments at Bell Labs, included the waxed disk and film methods. When using the waxed disk, a record-like platter was synchronized to the film, while the film method encoded the sound photographically on the film.

Football fans rarely endure a season without hearing the argument that football inside domes is not the same as the old outdoor games in the rain and snow. Actually, the first indoor game occurred in 1931 in the Atlantic City Auditorium filled with two and a half million pounds of dirt. Washington and Jefferson College tossed a white football with Lafayette before 20,000 fans dressed in formal evening clothes. After the game, many couples attended a dance elsewhere in the auditorium.

Many changes were made to the University and the College during this quarter century; 1912 was especially busy. The Electrical Building, not to be confused with the present Electrical Engineering Building, which prior to the summer of 1912 housed both the power plant and the department of Electrical Engineering, was made available entirely for instructional purposes. Lecture and recitation rooms, a designing room and many pieces of laboratory equipment were added to the building.

Similar changes occurred in other departments. The department of Architecture added to its drawing room equipment. Shop laboratories were inspected and revamped, reaching new heights in operator safety.

An area between Mathews and Goodwin north of Green Street was acquired to build a new transportation building. The fireproof structure would house the department of general engineering drawing and the department of mining engineering.

Growth of the College slowed because of the First World War, but by 1920 it was suffering from post-war growing pains. Engineering enrollment was double that of 1917, but there was a



smaller teaching staff and an inadequate supply of equipment and classroom space. Instructors had also left the University for higher paying jobs. One Civil Engineering teacher, paid \$1500 per year, found a job paying \$4500 per year outside the University.

The war also affected the physical appearance of the campus. In 1921, plans were made to build a stadium in memory of the sons of Illinois that died in the war. Construction of Memorial Stadium began in the fall of 1922 after a fund-raising drive. In order to erect the steel structure during the winter, the plans called for pouring the concrete that fall. The forms for the walls and stands would be put in place in the spring.

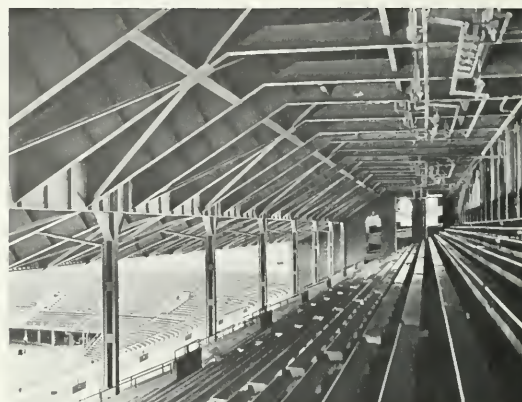
Three novel engineering features were used in the construction. Instead of stairways, the stadium would have ramps. Each wall was cut eight times vertically and horizontally to allow for the expansion and contraction of the concrete. To drain the stand during wet games, a system of gutters completed the stadium. By November of 1923 the stadium, one of the few large stadiums to have a balcony or upper deck, was finished.

Beginning a construction boom, several new buildings were raised in 1924 at a cost of ten million dollars. Included were McKinley Hospital, the Graduate Library, the Agriculture Building and the Commerce Building. In 1929, Lincoln Hall Theater was constructed following guidelines on acoustics described in a *Technograph* article. The stage reflected sound toward the audience and the upholstered seats minimized excessive reverberation. Construction on the skating rink began in 1931, with football profits paying for most of the \$300,000 cost. After 157 days, work was completed without any serious injuries.

Physically, the University changed greatly, while socially, the engineering students followed cycles. In 1913 and 1914, successful engineering dances were held. By 1923 an engineering day was held. The events included a parade in which each department had a float describing its field. Afterward, speeches were made by the deans and everyone proceeded to the Engineer's Dinner and Dance.

Some habits were deemed unacceptable by the *Technograph*. In 1925 an editorial asked students to quit smoking in order to give the University dignity and insure against fire. Another reason was the 35 year old University rule against smoking.

One writer in 1931 disapproved of the wearing of corduroys on campus because of their "dressiness." Although he respected the desire to maintain a neat appearance, he thought that



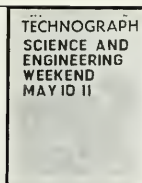
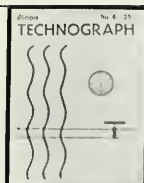
After extensive fundraising, construction began on Memorial Stadium in 1922. Ramps, gutters, and an upper deck were among the unusual attributes of the new facility. (Daily Illini file photo)

students should not always look like typical engineers. Corduroys belonged at the Corduroy Cotillion, which was to be held in the near future, and not on the engineering campus.

By 1933, the College was again socially dead. The Engineering Council was inactive and a dance had not been held since the Corduroy Cotillion. Not until spring of 1934 did the College again come alive with the first Saint Patrick's Day Ball. Over 250 couples attended the first social event in three years. "Erin go Bragh," inscribed on the Blarney Stone, was translated to mean "Saint Patrick was the first engineer," adopting Saint Patrick as the patron saint of the engineer.

Clubs did manage to stay alive during this period of erratic social behavior. Radio amateurs joined together in 1926, forming Synton to promote interest in radio at Illinois. Among their plans were talks given by authorities about radio. Another campus organization, the flying club, gained practical experience in 1931 by constructing a glider. Pulled by a car to launch, the aircraft was a simple, open cockpit affair used to help train future pilots.

In several ways, the College changed its attitude toward the students. The language requirement gradually began to disappear. Prior to 1922, engineering students had to take eight



The Quad in the 1930's barely resembles the area's appearance today. Extensive construction of new laboratories and classrooms was a hallmark of the University during the era. (Daily Illini file photo)

hours of a language, but that year a new policy allowed two years of language in high school to fulfill the requirement. By 1931, the requirement to take one year of geology replaced language in the Civil Engineering department.

The quest for the perfect grade-point system was not ignored. The year 1934 brought a new system to the college of engineering. The range was from three points for an A to zero points for a D, with an E earning no credit. In all, 136 points were needed to graduate.

While the College regulated the grade point system, the University deregulated class cutting. The University-wide class attendance rules were eliminated in 1931. Instead, instructors held the responsibility to administer punishments for students who did not go to class. A challenge was then issued by the *Technograph* to students to attend classes regularly and to teachers to use their new power not to rule over their students, but instead evaluate their teaching using class attendance.

With the many changes in the University and advancements in technology, one could never assume that an engineering magazine could not change with the world. In 1911 the *Technograph* began publication as a quarterly instead of an annual as in previous years. Work on the "high plane" of educated faculty members was no longer featured; articles more understandable by students replaced them. The magazine began to take on the form of a more news oriented periodical, with editorials, ads and

notes of interest. After a two year lapse in publication, in 1920 the magazine was published close to its present size and had even adopted glossy paper. Features were added, and by 1930 the magazine had expanded to a monthly publication.

Providing some entertainment became important with the addition of features like "Technolaffs," the monthly joke column, "Bucket and Shovel" and the "Ball and Chain Club." "Bucket and Shovel" honored students and faculty members for their actions. The shovel symbolized digging for dirt while the bucket caught the dirt. Scandals such as the wearing of a bobby pin by a man or tripping in the lab and making a mess highlighted this column. "Ball and Chain Club" followed a similar theme. According to the first installment, "This club was conceived to honor those poor suffering engineering creatures who have added to their woeeful worries with entangling skirt alliances." In other words, if someone was suspected of having a girlfriend (only two women were enrolled in the College in 1934, so boyfriend was not mentioned) chances are the details would be revealed in the *Technograph*. Of course, while he was planning a romantic interlude with his sweetheart, he could consult the *Technograph* for information on the possibilities for a quiz in his TAM class. ■

Society Changes as Campus Grows

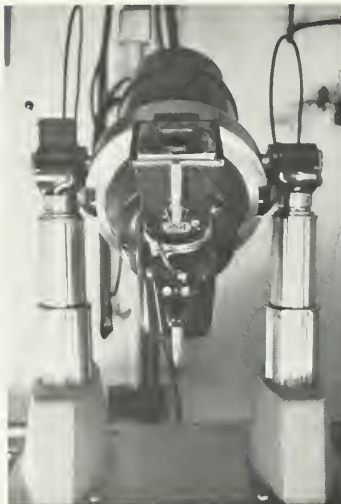
Technograph reported changes in both world maps and campus maps to the College community in the years between 1935 and 1960.

The 1930's were years of depression in the United States. In other parts of the world the decade was marked by renewed wars, loss of national independence, and acceptance of totalitarian dictators. Until the late 1930's Franklin Roosevelt was concerned more with his New Deal than with Adolf Hitler's New Order.

As the school year of 1935 began at the University and the *Illinois Technograph* began its second fifty years of publication, the College suffered through some problems of its own. Rumors circled the campus that distinguished members of the faculty were leaving for enticing offers from other institutions. Fortunately, these concerns proved false and the College drew its largest enrollment since the depression, with the mechanical engineering curriculum attracting the most students.

Graduation requirements in the 1930's were somewhat different from those of today. One past requisite was the senior inspection trip—a visit designed to acquaint the student with large industrial enterprises. Furthermore, prior to 1913 undergraduate students were required to write a thesis on an approved research topic. Due to the rapidly increasing number of students in the engineering curriculum however, the College was forced to drop this requirement.

The growing number of students required more facilities. *Technograph* reported in 1936 that the erection of the Mining and Metallurgy Building began at a cost of \$50,000 for both the building and its equipment. The highlight of the facility was the Metallography Lab which



This deep therapy x-ray machine was purchased and installed in 1959 when Burrill Hall was built. The machine operated until a tube was damaged last year. (Photo by Pam Susemihl)

was to have twenty Metallurgical microscopes, a grinding room, and a dark room.

In 1937, many of the problems confronting television were nearing a solution. Most experts believed that television was soon to be a reality. However, only a few programs would be presented and the variety would be limited to a few available channels. Also, there would be room for only a few stations, except in the very high frequency spectrum.

In 1939, a University student presented an interesting theory of heat. Realizing it would be helpful to understand the relationship between light, energy, and heat, this student attempted to show how light and heat could be composed of particles. He believed this theory offered an explanation for the conversion

of water into steam. *Technograph* reported his theory: "when enough heat particles are attached to water molecules, the force of repulsion of the heat particles overcomes the force of attraction of the water molecules. The water molecules are pulled apart, causing volume expansion and the conversion of water into steam." This idea was criticized by some members of the Physics department.

Hoping to really determine what holds the atom together and keeps it from collapsing, physicists from the University investigated the nucleus of the atom by bombarding it with high speed particles obtained from a cyclotron. This instrument was capable of producing energies of 2 million electron volts which gave the particles a velocity of 12,000 miles per second. Though small in comparison to other cyclotrons, this instrument was sufficient enough to form boron from beryllium.

Following the bombing of Pearl Harbor in 1941 and the United States' declaration of war on Japan, many advances such as radar detection and improved techniques in the shipyard took place. Campus also experienced progress, and the magazine quickly reported the changing environment.

Enlisting in the Reserve Officers Training Corps (ROTC) proved to be a popular choice among engineers on campus during World War II. In fact, the curricula offered at the U.S. Military Academy was almost identical as that offered in the College. Engineers were the third largest unit in the brigade. The Seabees, part of the navy's civil engineer corps, also became an important portion of the navy during wartime. The Seabees were responsible for construction and maintenance of naval shore establishments.

The University became the first school to own an electron microscope in 1943. Housed in Noyes Lab and costing

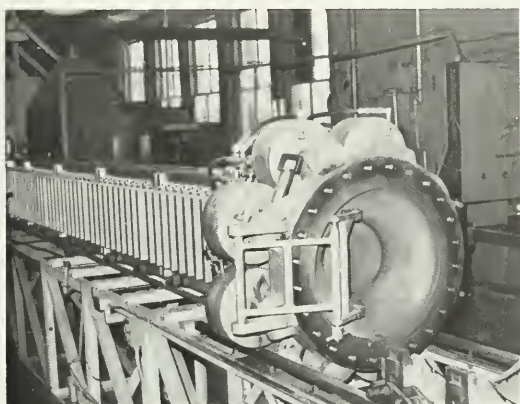


\$10,000, this microscope produced an image on a fluorescent screen which converted the electron image to a light image. This device became a great asset to science for its ability to produce an enlarged image of a minute object by means of a focused beam of electrons.

As technology advanced, the need for more specialized workers increased. To satisfy needs, the University added the department of aeronautical engineering and designed a 136 hour curriculum in the program. At this time the University was also constructing the Willard Airport. Upon completion this airport served as a base where studies were performed on pilots under various conditions. The results were used in standardizing navigational equipment.

Due to the great increase of women in the labor force between 1930 and 1940, many women became interested in obtaining a greater education in liberal arts as well as in technical science. In 1945, a group called "Association of Women Student Architects and Engineers" became organized on campus, making it the third such organization in the country. The purpose of the group was to promote friendship and understanding among the women engineers, the faculty, and the profession.

Changes continued to be made on campus, especially the engineering campus. In January, 1947, plans for the new Mechanical Engineering Building were discussed. Also, the Electrical Engineering Building was under construction at the corner of Green and Wright. This construction necessitated the straightening and rechanneling of Boneyard Creek. Furthermore, ideas were being discussed for the new Chemistry and Chemical Engineering Laboratory. When completed, it would be the largest in the United States. In October, the University built a branch



This shock tube, completed in 1952, was designed to simulate the effects of shock waves on an air foil. (Photo by Andrew Koepke)

campus on Navy Pier in Chicago which consisted of 4000 students and 276 faculty.

Even in the mid-forties, engineers were accused of lacking the writing skills required of the field. Engineers, it was emphasized, needed to communicate clearly to fellow engineers in industry. Many companies felt that although graduating engineers had great technical skill, they were ill-prepared for management positions; they claimed engineers should be educated in business, economics, management, and fundamental accounting. At the time, a beginning engineer earned about \$300 a month while a management engineer in non-technical areas received nearly \$900 a month. To compensate for the engineer's lack of a perspective of the world in which he lives, larger corporations began pressuring schools to give students five years of training instead of four.

When the war ended, many Americans were concerned only with their own security, not the nation's. Wartime wages had doubled from their prewar level, as had the gross national product. A great in-

crease in car sales created problems of overcrowding in many cities. With the passage of the 1956 Highway Act, the construction of interstate highway systems began. The Edens Highway became a solution to Chicago's traffic bottlenecks. The highway had six lanes and was designed to handle cars traveling at 70 mph. *Technograph* predicted that by 1971 there would be \$50 billion worth of these new expressways.

As the Cold War began to get hot and the North Koreans invaded South Korea, President Truman stationed the Pacific fleet off Formosa and ordered American aircraft to support South Korean forces. Meanwhile, many changes were being made on the homefront.

The annual Engineering Open House, reported *Technograph*, was a bit more extravagant in the fifties than it is today. The festivities began when a rumble in Boneyard Creek erupted into a twenty foot geyser which spurted kelly green water. It was claimed that this event signaled the arrival of the Blarney Stone

Football Guards

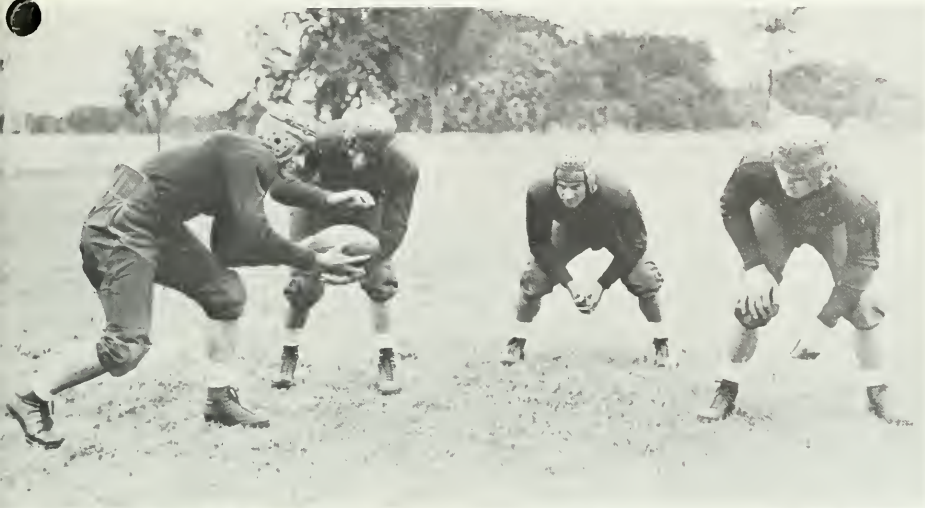
In the early days of the *Technograph*, a football player was a relatively unprotected athlete. Helmets were made of leather and offered no face protection. Shoulder pads were thin and didn't distribute the force of a blow as today's pads do. Jerseys, made of wool or cotton, were hot during warm weather.

The ball also has undergone drastic change. Originally, it was stuffed with straw and was much larger than today's ball. Damage was not a problem because kicking was not originally an aspect of the game.

Below, a ball from the mid 1940's. Right, Illini great Red Grange, still in shoulder pads, holds up his 1924 Jersey (photo courtesy of the Athletic Association). Bottom left, a 1910 player (photo courtesy of Wham postcards, Strauch's student life series). Bottom right, a player 12 years later (photo courtesy of the 1922 Illio). Top right, players from left D.R. Mills, F.H. Walker, J.A. Timm and F. Lanum from the 1929 Illinois football squad. Bottom right, Red Grange wearing a leather helmet in 1927 (photo courtesy of the 1927 Illio). (text by Dave Colburn)



Technovisions

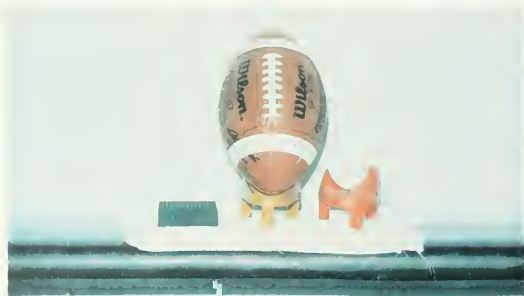


Technology Adds Safety

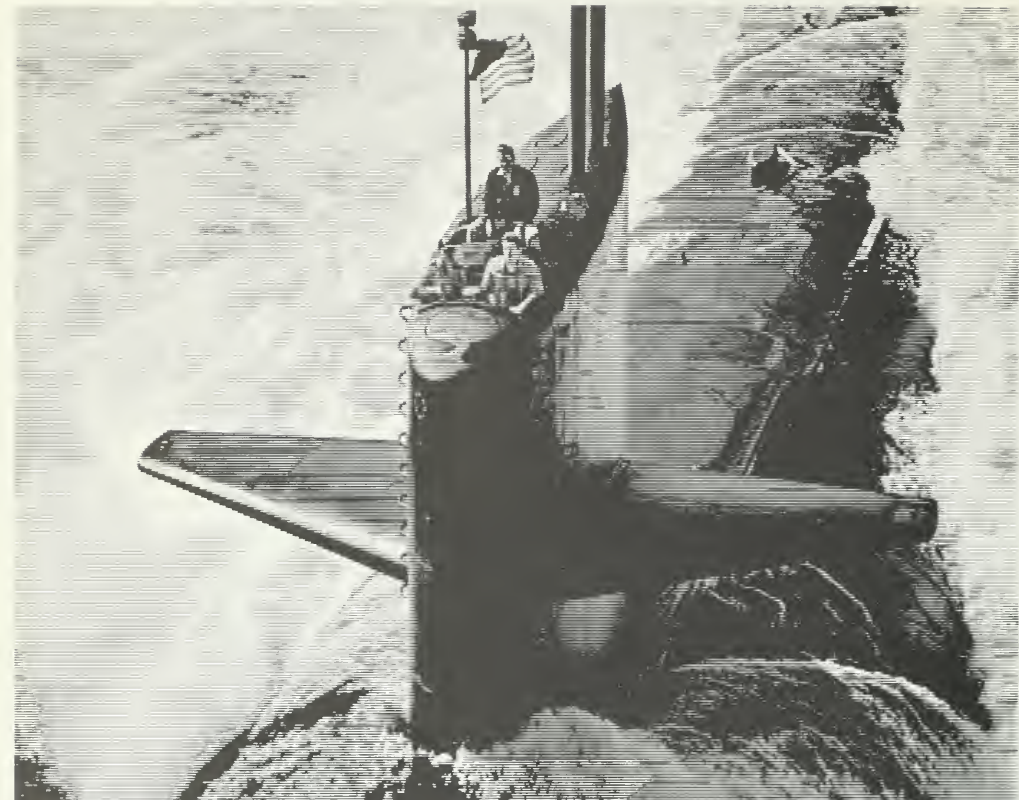
Relative to athletes of the past, today's football player is well protected. Helmets feature a hard plastic shell that is padded to transfer the impact of collision to less vulnerable areas of his head. Shoulder pads vary for different positions and are also designed to transfer energy away from the weaker points of the player's body.

Varieties of shoes exist not only for different positions, but also for different playing surfaces. The increased importance of kicking has led to different kicking tees of varying thicknesses and design.

Below: Some of the different kicking tees and a modern football. Right: A glimpse of the 1984 Illini versus Iowa game gives a comprehensive view of today's equipment. Below right: Various types of shoes are used for various playing surfaces. Above far right: Shoulder pads change in size and protection to fit players' individual needs. Below far right: Helmets also change with the wearer's position. Not only do they have different padding for different positions, but the face guards change from helmet to helmet. (photos and text by Dave Colburn)







THE NUCLEAR NAVY. RIDE THE WAVE OF THE FUTURE.

You're deep under the sea. There are 4600 tons of nuclear-powered submarine around you. Your mission - to preserve the peace.

Your job - to coordinate a practice missile launch. Everything about the sub is state-of-the-art, including you.

The exercise - a success. You're part of that success and now you're riding high.

In the nuclear Navy, you learn quickly. Over half of America's nuclear reactors are in the Navy. And that means you get hands-on experience fast.

You get rewarded fast, too. With a great starting salary of \$22,000 that can build to as much as \$44,000 after five years. And with training and skills you'll use for a lifetime.

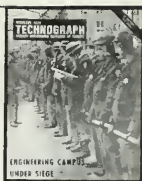
Then, whether you're in the

Mediterranean, the Pacific or the Atlantic, wherever you move around the world, you'll be moving up in your career and in the Navy.

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of St. Patrick, patron saint of engineers. On Friday afternoon, the traditional St. Pat's Day parade took place with each engineering society contributing floats. Many engineering facilities were open for public tours and numerous displays demonstrated the various aspects of engineering.

In 1955, the U.S. employed the first guided missile to be used in defense, a supersonic anti-aircraft rocket called NIKE. This two-stage rocket was capable of intercepting and destroying enemy aircraft regardless of evasive action.

The same electronic principles that guided missiles were hoped to be applied to the operation of artificial limbs and braces. An electronic firm attempted to find a method of electronically releasing and controlling the energy required to operate an artificial limb or brace at the will of the wearer.

With the development of new technological areas such as atomic energy, antibiotics, jet propulsion, and electronics, the demand for engineers skyrocketed. It was stressed that an increase in the number of engineers was critical to the nation's welfare and security. Unfortunately, nearly a twenty percent shortage of engineers existed. Nevertheless, Dean Walker of Pennsylvania State University believed that women should not become engineers. Although he admitted that "under certain circumstances" women could have distinguished careers in engineering, he thought most women lacked the basic capabilities required. In addition, since most women wished to get married and have a family, companies didn't feel they could afford the risk of investing in a woman engineer.

Dean Walker did not express his views without opposing comment from *Technograph* articles and readers. Many people felt that the great demand for engineers made women a logical choice. In 1959, male engineers were warned about



Electrical engineering professor Paul Coleman displays what he terms a vest pocket microwave accelerator and what textbooks designate as a ribatron. Developed by Coleman in 1946, the ribatron can generate up to 2,000,000 volts—a still unmailed record. (photo by Jay Zeff)

the "slide rule carrying coeds" who were uniting in trying to gain membership in the Society of Women Engineers. The society's objective was to involve more women by informing the public of the availability of qualified women. By 1960, the general outlook on women in scientific professions began to change; at this time there were sixteen women enrolled in the College and companies were becoming interested in employing women engineers.

As the excitement heightened in the dream of conquering space, many students wanted to learn how activities in space could be accomplished. Hence, a "Rocket Society" developed on campus. In the summer of 1959, progress was made when an aircraft climbed over 100 miles into outer space. This flight provided in-

formation on both prolonged weightlessness as well as control and stability at high speeds. The aspect of human capabilities in space were also considered. For example, many people wondered if man's chemical composition could tolerate changes in his environment such as high acceleration, weightlessness, cabin pressure, temperature, humidity, decompression, solar and cosmic radiation, and boredom from isolation.

Despite the characteristic world turmoil of the years between 1935 and 1960, the *Illinois Technograph* continued to adapt to the changing society. While technology and the University developed over time, the *Technograph* reported the newest directions of research in the fields of engineering. ■

Progress and Politics

The modern era of 1960 to 1985 brought to *Technograph* new directions of thinking for both the field of engineering and the American society.

The latest quarter century heralded many technological landmarks, while the *Illinois Technograph* and the University at large similarly underwent considerable changes. Because *Technograph* evolved with both society and the University, patterns of change in both can be traced simply by studying the magazine's history.

Among the most obvious of the changes in the University setting could be seen in the presence of new buildings. The new Civil Engineering Building was finished in 1965, while Loomis Laboratory pre-dated it by only a year. Also in the mid-sixties, the design for the Undergraduate Library was proposed and approved by the Board of Trustees, although it was not the first underground library to be built.

The University of Illinois-Chicago, called Circle Campus because of its location near a cloverleaf in the Expressway, was also constructed during these years. The new campus was the subject of many *Technograph* articles throughout the early seventies. Circle Campus boasted a thirty story office building for its faculty, and a suspended walkway interconnecting the principal buildings. At the time, it was considered one of the most appealing urban college campuses in the country.

Though building construction progressed rapidly both on the Champaign-Urbana campus and in Chicago, some aspects of University life remained the



The agricultural engineering building is the most recent addition to the College's laboratories. Continual updating of campus facilities has been a hallmark of the College for much of the past century. (Photo by Phil Messersmith)

same. Boneyard Creek continued to serve as the depository for unwanted hardware and waste in the College. A 1961 *Technograph* story described the Annual Boneyard Fishing Contest. Many lucky entrants angled various pieces of a mainframe computer the University had discarded. One student discovered a suicide note in a bottle, and others found notes attached to sliderules. A short time later, many articles appeared in the magazine requesting a thorough clean-up of the polluted creek.

The University's adjustments to social changes were noteworthy and significantly affected the *Technograph*. Both the magazine and the College grew to accept women in engineering. The final article of a long series in opposition to women in the engineering curriculum appeared in 1971. Since then, opinion changed and *Technograph* frequently asked, "Why aren't there more women in engineering?"

Changes in social trends became further defined through advertisements. Bethlehem Steel ran a series of advertisements in the sixties depicting a pouting

woman, neglected by her boyfriend while he closely studied a pamphlet called "Career Opportunities with Bethlehem." Later, in the early seventies, Bethlehem ran a similar ad with both men and women studying the pamphlet. The caption read, "This book replaces *Playboy*." During an engineering shortage in the middle sixties, many corporations used full-page advertisements to solicit prospective employees. Graduates were faced with deciding which company could provide a job giving them the most benefits. Companies would use lucrative selling points, including the proximity of the plant to the beach, the availability of women, and various other non-technical aspects of employment. These ads were aimed at a narrow cross-section of society, the male engineer, who frequently fell prey to such recruitment tactics.

Early in the 1960's, *Technograph* also went beyond its traditionally technical forum format. The magazine featured photos of attractive female undergraduates in a section called "Technocuties." Similarly, "Technocracks," a jokes column,



was discontinued in 1965, as a greater percentage of *Technograph* was devoted to strictly technical matters.

The prevalent fears and concerns of the Cold War also found a place between the magazine's covers. The first issue published during Kennedy's Administration contained an article on the construction of bomb shelters, and later issues included several smaller articles on life inside the Soviet Union. During the late sixties, the magazine's political views culminated in reaction to the controversial Viet Nam war. In 1969, numerous anti-war editorials were published as well as a reprinted telegram to the editor from local congressmen, concerning the riots at Kent State. Soon after, political lobbyist Ralph Nader, who believed engineers lacked a social conscience, wrote a letter addressed to the engineers at the University. This occurred during the major court battle concerning automobile safety which produced his book, *Unsafe at Any Speed*.

As well as becoming more politically aware, engineers began to take a greater concern with their self-image. An English major at the University wrote an article titled "Crossing Green Street." His critique of engineering society was grimly received by the readers of the *Technograph*. The author claimed that he found a concentration of excellent students who had little on their minds beyond their studies. Even the slang terms used to describe an engineer during the sixties—"slide-rule king" and "poindexer"—only seemed to further alienate engineering students from the non-technical students.

The seventies returned *Technograph* to its traditional format following the brief affair with politics and volatile non-technical topics. Society's misconception

Changing Times



Intrigued by exotic designs?

Among the societal issues displayed in *Technograph* was the battle for women's rights. This type of recruiting advertisement, the "Technocutie" feature, and a series of articles against women in engineering all disappeared from between the covers of the magazine in the early 1970's. (Advertisement from *Illinois Technograph*, 1966)

that engineers were responsible for what went wrong in the world was replaced with a surge in popularity and respect for the engineering profession. Once again, engineers expressed their pride for being at the forefront of technology. The celebrated space program gave society new confidence; American ingenuity had landed men on the moon and returned them safely to earth. Computer-guided satellites orbited the Earth and provided a major breakthrough in communications networks.

The campus, country, and *Technograph* alike were amazed at the advances in microelectronics. The sliderule, a major

engineering tool, was replaced by the pocket calculator.

Automobile design of the sixties focused on greater horsepower and faster acceleration while different priorities in the seventies changed those concerns to fuel efficiency and accident safety.

The computer age also developed, and with it the increasing demand to quickly process information and store large quantities of data. The University greatly expanded its own computer facilities during the seventies. By 1976, the Programmed Logic for Automated Teaching Operations (PLATO) system began its career in education. The campus doubled its computer facilities for faculty and students and provided new emphasis on computer related classes and curricula.

Now, late in the twentieth century, *Technograph* remains largely unvaried from the digest form it was conceived as 100 years ago: a journal for the technically minded, written and produced by students in engineering. *Technograph's* century of survival can be accredited to its ability to adapt along with the technology it reports. Unlike the sliderule, the magazine has adjusted to gradual modifications and continued to serve as a benefit to the engineering community at the University.

Changes in society have been numerous over the past twenty-five years, and the technology has changed accordingly. Space flight, computers, lasers, and other new technologies have only begun to shape today's society as automobiles, electricity, and railroads shaped life in *Technograph's* earlier days. The success of the *Illinois Technograph* over the last 100 years is due not only to the commitment of the College's students and faculty, but also to the importance of technology in developing American society. ■

The University and the country in which it resides are dynamic in nature. The *Technograph* has always followed the alterations of our society, as the following direct quotations from past issues illustrate. The italicized dates at the end of each excerpt is its original date of publication.

Stereotypes Can Be Cured

"The various engineering societies at the University of Illinois are in need of a coordinating body. The individual organizations within themselves carry on active and successful programs, but there is no formal means of cooperation between these societies.

"In an article about the St. Pat's Ball, it was stated that Illinois has long been known as 'the deadest engineering campus in the country.' This statement may be a little harsh, but the students in the College of Engineering have done little to disprove it. The general public looks upon engineers as a group of rather 'queer' men, married to their slide rules, and so absorbed in their work that they hardly know that the rest of the world exists. We know that is not true and it is up to us to prove to our 'public' that engineers are as normal as any other person. The first step in that direction is to form a united front.

"Several years ago there was an engineering council on campus. It was composed of representatives of all the engineering societies. It acted as a directing body for all combined activities. An organiza-

nization of this nature would not in any way infringe on the individual rights and functions of the societies but would provide a permanent, united group to coordinate the efforts of the societies when such action is necessary." (April, 1947)

Digging History

"From nearly every standpoint, the design and construction of the Panama Canal is the most difficult engineering project and the most important work ever undertaken by a nation or individual. The failure of previous attempts to carry out this great undertaking have only served to show the variety and magnitude of the obstacles to be overcome. But since the U. S. has taken upon itself the task of building the canal, the success of the enterprise is assured.

"Panama grants to the United States 'in perpetuity the use, occupation, and control of a zone of land ten miles wide,' and grants a monopoly of traffic across the isthmus. This treaty insures not only the construction of the canal, but our undisputed management of it in our own way for all time to come." (1904-05)

Architects to Be Licensed

"Illinois is the first state to enact a law requiring every practicing architect to obtain a license from a board of examiners. This law is of interest to architectural students, since it insures that all who hereafter practice architecture in Illinois must be versed in scientific knowledge and technical training. The law will be of great benefit to the public, since it protects citizens from injury or loss by incompetent architects, fixes the responsibility for dangerous structures, and tends to rise rapidly the attainments and position of the profession." (1897-98)

Expanding Capacities

"The new laboratory in the EE Department is practically completed. . . it will accommodate two sections of thirty men

each. One section will work with alternating current apparatus and the other with direct current machines.

"The new radio broadcasting station WILL is under construction. The tower and studio will be located on Illinois field." (March, 1926)

Electricity Wins Over Water

"A new building of modified Georgian design is now in the initial stages of construction on the corner of Wright and Green streets. Replacement of the Health station and former president's home by this structure for the electrical engineering department of the College of Engineering is to contain recitation, laboratory, shop, and office space for about half of the present electrical engineering students and staff. It will cover an area extending 213 feet along Green Street and 141 along Wright street, and is therefore of large enough proportions to necessitate straightening and rechanneling the famous Boneyard Creek to a position a few feet north of its present location." (March, 1947)

German Skyline Dwarfed

"Buildings over twelve stories in height have been prohibited in Germany by order of the German government. In some provinces the maximum height is limited to ten stories, and dwellings in no part of the country can exceed five stories." (May, 1930)

Dancing Engineers

"This year for the first time, we engineers will strut our stuff in an open house and engineer's dance, all the same weekend! Let it be understood moreover, that the Slide Rule Shuffle is to be no ordinary one. The Dance Committee, under the direction of Spencer Brown, is making arrangements for the dance itself, but it is up to you, and you, and you to show the rest of the University a social

Technotes

affair that will be one of the high spots of the semester social whirl. . . . It isn't an accident that this banner event is to be. The whole thing was given an initial acceleration by the Engineering Council—"The Voice of Engineers"—which was reorganized last fall after a year's lapse." (March, 1941)

No Stadium Sway Here

"Why does the Illinois Stadium stand the mighty roars and stamping feet during the thrilling moments of a football game? W. A. Slater '06 is probably responsible for he kept a watchful eye on all the concrete that went into it. . . . He has received three degrees from Illinois." (January, 1929)

Rolling in Money

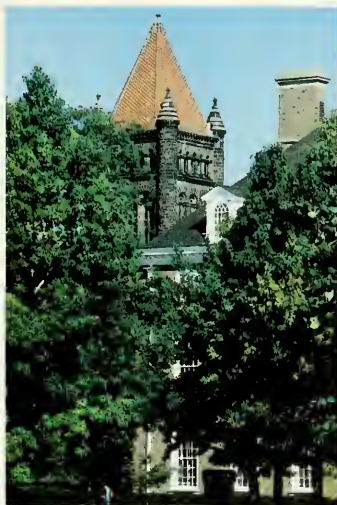
"The initial salary by engineering graduates is well typified by the class of 1924 with reported median low salaries at \$110 per month and median high salaries at \$175 per month." (May, 1926)

A Longer Day's Journey Into Night

"The progress which has been made in the past decade in the matter of illumination is little short of wonderful. . . . night work has come to stay; in other words, modern communication demands a longer day than that afforded by daylight. . . . important developments. . . . have actually forced the consumer to demand protection from eyestrain." (November, 1913)

Technograph Alterations

"There has been a feeling prevalent among the students and the engineering faculty of the University of Illinois, that the Technograph in the past few years has not completely fulfilled its mission. Last year it was only due to the extraordinary efforts and success of the Technograph Board with the aid of the faculty that the journal survived. Due to these conditions



Altgeld Hall was originally constructed as the University's library in 1897, while the Illini Union was constructed on the site of University Hall in 1941. (Photo by Phil Messersmith)

Dean Goss early in the term, called a conference consisting of a faculty committee and representatives from the several societies to consider its reorganization. It was decided that the Technograph as an annual publication was not feasible nor was there a demand for it. Plans for a complete reorganization were then presented by the Technograph Board which included a new constitution and by-laws. It was the general consensus of opinion that a live quarterly publication would be more representative of the growth in size and importance of the College of Engineering." (March, 1911)

WPGU Tunes In

"After two months of preparation, the first program was broadcast from WPGU at 7 p.m. on December 6, 1953.

Facilities for the studio—first located at 1340 Arbor but later moved to its present location at 1241 Euclid in the Parade Ground Units—were donated by the University housing division." (November, 1954)

Library to Be Dedicated

"We present to our readers the university library, [Altgeld Hall,] which is to be completed the first of June. The style of the structure is Modern Romanesque—a style derived from that manner of building which prevailed throughout Western Europe from the fall of the Roman Empire until the rise of the Gothic Style, and was directly or indirectly inspired by Roman examples.

"The building will be dedicated the coming Commencement Week, which is an especially appropriate time, because ground for it was broken with due ceremony on last Commencement Day." (1896-97)

The Feminine Mystique

"It seems that Marjorie Voight was lonesome over in Ceramics and talked a fellow townswomen into enrolling in the clayslingers' school. Martha Schultz is the freshman miss who will have to be non-chalant in a classroom of boys. . . . Martha's settlement on the north campus keeps the population at two, since Dorothy Segur has deserted us." (December, 1934)

Mind Games

"Students of engineering subjects, whose chosen profession will require a constant use of figures, often fail to appreciate the value of rapid methods of computation. Even when they have a conception of the amount of time which can be saved, and of the means to be employed to that end, they neither make use

of their knowledge in everyday work, nor try to increase their store. It requires practice begun in early days of school to make one skillful in handling the simple operations of addition, subtraction, multiplication, and division; and too many are content to stop even before this point is reached. They are ever striving to master those devices which effect a saving of time in the 'field,' and lose sight of the equally important subject of rapid 'office work.'" (1889-90)

Women Set PreSWEdent

"A new venture in student organization is being launched on our campus. At one time, architecture and engineering were considered fields for men only. However, this is no longer the case, but many of the old misgivings and prejudices remain. In order to help overcome these and obtain for themselves the recognition that they feel they rightly deserve, the feminine architectural and engineering students on the campus have organized."

"The group is known as the Association of Women Student Architects and Engineers. The announced purpose is 'to promote friendship and understanding among women engineering students, the faculty, and our profession.' This is to be primarily a professional organization, but it is hoped that in the future a system of awards and recognition for scholarship and activities can be instituted. Any feminine architectural or engineering students are eligible for membership, and feminine chemistry, physics, or mathematics majors may obtain associate memberships." (March, 1945)

Engineers Find a Home

"This handsome building, [Engineering Hall,] for which \$160,000 was appropriated by the last legislature, will be ready for use by the first of next fall term. Plans were asked for by the

trustees from the graduates of the architectural department of the University of Illinois. The first prize was awarded to Mr. G. W. Bullard of Tacoma, Washington, who was made architect of the building. It is a matter of pride to the University that one of her graduates should have furnished the plans for the imposing building." (1892-93)

The Pre-OPEC Dream World

"Fuel is so cheap that except for those who cover large mileage, the difference between 25 miles and 40 miles per gallon is not in itself a matter of prime importance."

"America is more and more becoming a country where the average well-to-do family has more than one automobile, or would like to have a second car." (November, 1930)

Aviation Interest Soars

"Thus is expressed the enthusiasm of this generation for that new branch of engineering, and of life—travel by air. Airplanes have come and they have come to stay. The enthusiasm for them, while in part is just a fad, nevertheless is earnest, and very essential in the development of aviation, and finally, the enthusiasm is not going to dwindle until finally, travel in this manner is accepted as the usual thing." (January, 1930)

Atomic Energy Has Potential

"At approximately 8:14 a.m., August 16, 1945, Hiroshima time and date, the rest of the world became aware of the potentialities of atomic power."

"This field of atomic energy, now in its infancy, holds excellent employment opportunities for graduates with degrees in chemical, ceramic, metallurgical, and mechanical engineering. Not only is the work most fascinating, since the materials under consideration are quite unique, but the opportunities for advancement are great

since a graduate could 'get in on the ground floor' of this new industry!" (October, 1948)

If They Could See It Now...

"A new era began for the College of Engineering when the cornerstone of Engineering Hall was laid on December 13, 1893. Since then six more cornerstones have been laid for Engineering College buildings and now the Illinois student of a decade ago would scarcely recognize his surroundings were he suddenly thrust among them." (1901-02)

Ground Laid for Agriculture

"The newest curriculum offered, agricultural engineering, was announced at the beginning of the second semester this year. It is intended to prepare young men to handle problems relating to design of farm machinery, land drainage, and conservation, and to the building of farm structures. Already 6 students have enrolled in the curriculum." (April, 1934)

Sidewalks Rolled Out

"The university grounds were further improved, last fall, by the laying of a cement walk leading from the streetcar line to the main building and to the chemical laboratory." (1890-91)

Speedy Highway Construction

"Pier engineering students are taking a keen interest in the construction of Chicago's first superhighway—the Eden's Superhighway—now being rushed to completion. Destined to replace the heavily traveled Skokie Highway (U.S. 41), Edens is 15 miles in length and will ultimately be a part of the comprehensive expressway system planned for Chicago and Cook County. This new superhighway

follows the Skokie Highway although it deviates slightly from the old road in the residential areas where the required right-of-way width could not be secured." (*December, 1950*)

Road Materials Lab Established

"A Road Materials Testing Laboratory has been installed recently in connection with the Engineering Experiment Station for the purpose of practical aid to the State Highway Commission by testing all kinds of road material. Equipment for testing brick, stone, and gravel has been set up and is now in use. The laboratory is under the direction of Professor I.O. Baker, head of the civil engineering department." (*1905-06*)

EES a Turn-On

"The wireless telegraph, high frequency demonstration, telegraphone, 100,000 volt transformer, singing arc, fouslen arc, and the static machines and other apparatus exhibited by the Physics Department [at the Electrical Engineers' Show] drew appreciate attention from all the various classes of visitors, while those well versed in matters of science found them of real value." (*1906-07*)

New Campus Hot Spot

"Since February 8, the new Illini Union Building has been the popular spot on campus. The colonial beauty and modern efficiency of the \$1,505,000 needn't be told; it is in evidence. But our analytical minds can't let the glamour of the place possess us entirely, so we search for the engineering behind all of it." (*March, 1941*)

Deliverance from Livery

"The growth of the automobile manufacture has never been exceeded, if paralleled, by any other industry. . . . One firm alone proposes to build forty



Constructed in 1912, the Railway Wheel Lab played a major role in exploring improved methods and machinery for the railroad industry. Although the importance of rail transportation has since waned, research on the possibilities for today's rail industry still plays an important role at the University. (Photo by Mike Brooks)

thousand cars for the season of 1910. . . . The average retail price of these cars will certainly not be less than one thousand dollars. . . . It is only a question of time before the larger portion of the delivering, in the cities, will be done with automobiles." (*1910-11*)

Money for Railway Department

"In the last session of the legislature there was appropriated to the University \$200,000 for new buildings for the College of Engineering. In accordance with the plans, this money will be used to erect buildings suitable for the work of the Railway Engineering Department." (*1911-12*)

Romance on the Rocks

"The first [freshman] engineering lecture was given by Professor A. C. Calen, head of the Department of Mining Engineering on 'The Romance of Mining.'" (*November, 1930*)

State-of-the-Art

"By the help of the 'Thomas computing machine,' every arithmetical problem. . . . can be solved with surprising rapidity. The writer added a column of 10

numbers each consisting of 10 digits in a little over two minutes. . . . The cost is about. . . . \$225." (*1892-93*)

Draft Opposed

"The Technograph strongly supports the Senate proposal to abolish the draft and establish an all-volunteer professional army. The bill was introduced by a bipartisan group of nine senators in 22 January, 1969. The bill is a new version of a plan advanced by Senator Mark Hatfield (R-Oregon) in the past two years.

"To graduating seniors who are now making plans for their future, the Technograph staff wishes you the best of luck and condolences where appropriate!" (*February, 1969*)

Compiled by Sally Cohen, Dennis Franciscovich, Shelley Grist, Lesley Lee, Nata Mackevicius, Alfred Tadros, and Joe Wyse. Edited by Mary McDowell.

Although the universe is relatively unchanged from 100 years ago, the products of our world have. As with this issue's "Technoles," the following "Technovations" are taken directly from past *Technograph* issues.

Talkies Credited to Illini Prof

"Professor J. T. Tykociner, Research Professor of Electrical Engineering at the University of Illinois, conducted research over a long period of years on photo-electric tubes and their applications. Sound cinematography, or 'talking pictures' is one of his contributions to our American way of life." (*March, 1941*)

Not Just Hot Air

"A balloon borne electronic system that can bring radio, television, and modern telecommunications to people on emerging nations is undergoing final tests by TCOM (Tethered Communications) Corp. At least 15 conventional broadcast and microwave towers would be required to provide the coverage achieved by a single balloon-borne system." (*May, 1974*)

Talking to the Man In the Moon

"By combining the recent advances of electronics and rocket power, a compact 'rocket radio' capable of carrying a 100-watt transmitter the 250,000 miles to the moon in about 60 hours has been forecast by Associate Director J.A. Hutchison of Westinghouse Research Laboratories. With 50 pounds of storage batteries and less than 50 additional pounds devoted to an ultrashort wave transmitter and associated clockwork, signals could be sent to receiving stations here on local

conditions on the flight to the moon and for several days after it has landed there." (*December, 1946*)

Will It Ever Think, Too?

"A new student matriculated at the University of Illinois last September. This student, commonly referred to as a 'brain,' can work problems in five hours that would take a skilled mathematician all his working life. Of course, we are speaking of the new electronic digital computer now housed in the Engineering Research Laboratory here on the University campus." (*December, 1952*)

Whad'ya Say?

"Although hearing aids have progressed extensively since the hearing horns of several decades ago, the hearing impaired still suffer from difficulties such as static feedback, unstable response, and amplification of unwanted noise. All these could be solved, however, with a new device developed by researchers at the University of Wyoming.

"The basis of the computers used in the hearing aid is digital-signal-processing (DSP). A central processing unit handles digitized data to acquire designed programmed results. Software programs handle information fed into the computer by instructing the CPU on how to handle the input data.

"The new device improves upon its predecessor through its ability to adapt to changing signals by using a microprocessor, by suppressing noise better, and by responding more quickly to necessary changes." (*April, 1984*)

Send Me a Signal

"At the present time, however, because the volume of traffic is so great, the distance traveled by individual vehicles so long, and because of the fact that many of the drivers are traversing the road for the first time, it is imperative that there be some adequate method of furnishing the

drivers with information which will enable them to use the highways with maximum convenience, speed, and safety.

"It is highly desirable that the entire system of marking signs be standardized." (*January, 1926*)

Expanding Television

"It was brought out at this time [September, 1948] that the field strength required for UHF television would be 10 times that of the standard VHF field, with the coincident requirement for a tube capable of power output much higher than any previous tube of this type. . . . However, it was disclosed that, in nearly all other respects, UHF range was equal to or superior to the VHF band for television. With this latest result in mind, an intensive program of tests and experimentation was begun by the television industry in an attempt to perfect commercial UHF television." (*March, 1952*)

Bottom Heavy

"In their efforts to design higher skyscrapers, architects are limited by an enormous dead load of flooring. . . . A new type of floor paneling has been invented by steel engineers. . . [which] is designed to act as a solid steel girder embracing the whole girth of the building, preventing torsional quirks and reducing the danger of high wind or earthquake action. . . . For a 75 story building, it is calculated to save 2,000,000 pounds of dead load. . . . Thus, the dreams of a 100-story building may become a reality." (*March, 1930*)

Ski Resort Insurance Created

"Fluffy, white snow fell for the first time out of man-made ice clouds in General Electric's laboratories and promises to reveal new facts on icing on air-

Technovations

craft and determine effects of snowstorms in producing static in airplane radios." (January, 1947)

Laser Etch-A-Sketch

"The discovery of a new photochemical process at the IBM Thomas J. Watson Research Center now makes it possible to use lasers for etching organic polymers and biological materials without the occurrence of heating effects. Called ablative photodecomposition by its discoverer, R. Srinivasan, the process has potential for application in the photolithographic creation of integrated circuits as well as in the precise removal of biological material for medical and dental purposes." (November, 1983)

Wires Go Underground

"The rapid growth of metropolitan cities throughout the United States has made it necessary for telephone companies to improve their facilities for doing business. The large expenditures for repairs and the trouble experienced with storms are the principal reasons why companies are placing their wires underground." (1905-06)

EE's Hit Prime Time

"Television progress is being made at the University of Illinois with construction of a new electronic television system incorporating the most recent developments and technical features. This project is under the supervision of Professor H.A. Brown of the Department of Electrical Engineering. The amateur radio station license, W9YH, of the department permits television transmission within certain limitations and restrictions. The equipment will be used mainly for experimental purposes, but is expected to stimulate considerable interest and provide entertainment for visitors during the next Electrical Engineer's Show sponsored by the depart-



ment. The image produced by the television is approximately 1 1/2 inches square and is remarkably clear and well defined." (March, 1941)

Blinded by the Light

"It should never be possible for the direct rays from the electric bulb or other bright source to enter the eye of the one using the light. Churches should recognize this principle and discontinue the practice of wearing the audience and handicapping the preacher because of lamps exposed to view for at least a part of the services." (November, 1913)

Fission Products Measured

"Presently, research headed by Professor Bernard W. Wehring in Nuclear Engineering is being carried out that will allow accurate measurements of all fission product yields. He and his graduate student, Gino Dilorio, have developed a fun-

Some researchers have found the versatile modern laser to be a necessity. Here, a laser is used by graduate physics students Erramilli Shyamsunder and David Fung to study the dynamics of the protein myoglobin at low temperatures. (Photo by Dave Colburn)

damentally new experimental method to directly measure the fission product mass yields in thermal neutron fission. A fission fragment mass spectrometer, HIAWATHA, which has achieved 0.5 amu mass resolution has been constructed for this purpose, previous to which the best mass resolution achieved was 3 amu." (April, 1976)

You Could Hear a Pin Drop

"The science of the acoustics of auditorium is of comparatively modern development, beginning with the classic work of Wallace C. Sabine about

1900. . . he showed that the time of decay of sound depended directly on the volume of a room, on the loudness of the sound and inversely on absorption.

"Ideal acoustics may be found with conditions resembling the open-air Greek Theatre." (*November, 1928*)

Gutter Watcher

"An electronic umpire that can't dodge bottles or change decisions has been developed by General Electric for calling bowling fouls.

"Actuated by electric eyes mounted on the foul line of any alley, the automatic instrument sounds a bell or buzzer and flashes a light to indicate which of the sixteen alleys have been 'fouled.'" (*October, 1949*)

Marcus Welby Via Satellite

"A new beam transmitter operated on a shortwave of 14 meters can be focused on any country from the radio station in Rome. A minimum wave length of 40 cm is used so that thunderstorms, elevators, and all types of electrical equipment will not interfere.

"By use of this beam, you may sit in a theatre and see events which are actually happening thousands of miles away. Every hospital will be able to transmit and receive by x-ray photographs the best medical advice in the world." (*February, 1935*)

Mass-Spectrograph Created

"Dr. E.B. Jordan, Associate in Physics, has designed and built what is referred to as a mass-spectrograph, a basic research tool. . . . Only five such units are in existence in the world, Dr. Jordan's being the largest and most powerful, six times as powerful as any other. . . . It is a machine used principally for determining atomic masses or weights of the elements, but can also serve to determine the

amount of energy released when the nucleus of an atom is disintegrated by the popular atom-smashing machines. The design and construction of the mass-spectrograph is entirely new and original. The entire machine is supported on a concrete vibration-proof pier weighing thirty-two tons." (*December, 1940*)

A Shocking Demonstration

"A twelve-foot induction coil has been constructed under the supervision of R.E. Hart, '15, and with it he plans some very interesting and marvelous demonstrations. The coil gives 2,500,000 volts, which will generate a spark ten feet long. . . . The ten foot spark will be passed between two people who, it is hoped, will live to tell their grandchildren of the marvelous feat." (*April, 1915*)

Cool Heating Process

"The same microwaves that are used to send radar messages and television pictures can now cook a complete meal in 90 seconds or 40 complete meals in one hour. A megatron produces the 2,450 megacycle waves which cook the food in a cool, tightly-sealed oven. Only the food is heated." (*November, 1962*)

Microchips Arrive

"The IBM 5100 portable computer announced today uses an advanced Metal Oxide Semiconductor Field Effect Transistor (MOSFET) Read Only Storage (ROS) circuitry.

"The circuit density achieved on each chip is 48K bits. Each chip is approximately 0.23 inches square." (*December, 1975*)

Science's Light Side

"Today's version of the photophone sends beams of laser light through thin glasslike fibers. The technology involved is called fiber optics and finds applications in many fields other than communications. Medical technology uses fiber op-

tics to look inside the human body. Some mechanical devices utilize a fiber optic device to detect rotation of as little as one thousandth of a degree per hour. Many other sensing and monitoring devices based on fiber optics are under development or in use." (*April, 1984*)

Remember When . . .

"The new memory device, which combines the feature of high speed with a potentially huge information storage capacity. . . . consists basically of 10,000 tiny ring shaped magnets woven on thin wires.

"It can 'memorize' or 'recall' a bit of information in a few millionths of a second.

"It can store 10,000 bits at any one instant. It potentially has a very high degree of reliability.

"It promises to be relatively cheap, as memories for computer go." (*October, 1953*)

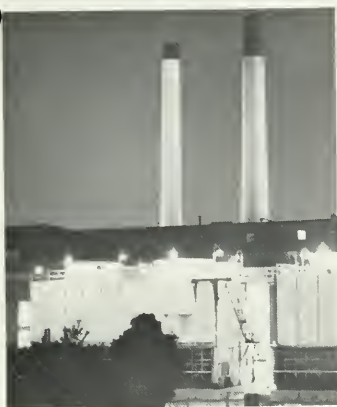
People Chutes

"How many times did you leave the ballpark before the exciting game was over, just to beat the crowd and get outside the stadium before everything got jammed up? This problem might be solved by a new and revolutionary development—the moving sidewalk.

"The belt is capable of transporting 15,000 passengers in an hour. Passengers step on and off as if it were an escalator, and it gives them the option of riding without any effort or of adding their own walking speed for a quick trip." (*May, 1955*)

Saver of Bent Bodies

"A 'wrist computer' to help divers avoid the bends has been invented by two GE scientists with a common hobby, scuba diving. The wrist inclinometer will guide swimmers in the stop and pause ascent



Abbott power plant provides the University with its primary source of electricity and steam. Constructed in 1941, the plant continually improves its safety and efficiency. (Photo by Dave Colburn)

from deep water which raids them of nitrogen absorbed by breathing high-pressure air. This routine prevents the bends, the formation of nitrogen bubbles in the bloodstream which cause internal pain and can result in crippling." (December, 1973)

Manhattan's Lightning Rod

"The Empire State Building is itself Manhattan's lightning rod because it reaches nearly a 1/4 mile into the sky. It's well grounded by massive steel work. Experiments have been carried on with 5,000,000 volt bolts of laboratory lightning in the research department of General Electric." (May, 1931)

Look Before You Send

"To facilitate better framing and as a necessity for quick focusing, each [television] camera has its own viewer which is a small television screen in front

of the operator mounted in a removable section on top of the television camera. By watching the viewer the operator always has a clear picture of the image he is transmitting." (April, 1953)

Power Plant History

"The prime purpose of this article is to acquaint the reader with some of the major causes which incited the construction and subsequent development of the Abbott Power Plant.

"Electrical loads exceeding 2500KW had already taxed the then existing power supply to its utmost. . . a better standard of illumination was necessary for the existing buildings and also for the recently constructed buildings including the Illini Union, Gregory Hall, McKinley Hospital, Men's New Residence Halls, Geological Survey Laboratory, etc.

"In addition, air conditioning systems were planned for the Student Center and new classroom building. . . heating requirements for the next ten year period indicated an increase to 200,000 pounds of steam per hour.

"Construction of the new plant began in January of 1940 and was totally completed in February of 1941. Temperatures in the [steam] tunnel attain values of 90-100 F (thus affording an excellent substitute reclus for annual Florida enthusiasts)." (May, 1944)

Whirlybird

"Three U.S. inventors have completed a 'rotor airplane.' This strange craft without wings is lifted by means of metal spools two feet thick which whirl on spindles. . . The inventors claim that their plane can lift ten times the load of any other plane of equal weight and that it's speedier and more economical to house." (December, 1930)

Nucleus Filled With Electrons

"Thus the elements may be arranged in a series beginning with hydrogen which has one electron per atom and ending with

uranium which has ninety two. There are a few gaps in the series, but eventually they will be discovered to fill all the gaps.

"In the nucleus, which is the minute center of the atom where most of the mass resides, there are electrons embedded, and in all but a few atoms the number of electrons is an even number. Apparently, the electrons go into the nucleus two by two as the animals went into the ark." (January, 1926)

Large Screen TV

"You've seen television. Now you'll see it in its finest form—giant projections of special events, transmitted only to theatres on private wires or radio beams to make movie going more fun." (December, 1950)

Versatile Petroleum

"The use of crude oil on railways and highways is attracting the attention of the engineering profession all over the country. Oil was used primarily as a preventative of the destroying and disagreeable dust so frequently encountered on both wagon-roads and railroads. Its field, however, is by no means limited to that alone, as many advantages to its use have been discovered." (1900-01)

Atypical Equipment

"Within the last month there has been installed in the Laboratory of Applied Mechanics at the University of Illinois a 600,000 pound testing machine of the vertical screwing type. This new piece of apparatus is of special interest not only because it is the largest ever built, but also on account of certain novel features of its design." (1904-05)

Dolby Sound—Almost

"There's no doubt about it, 'talking movies' have set the motion picture world by the ears. Most of the leading producers

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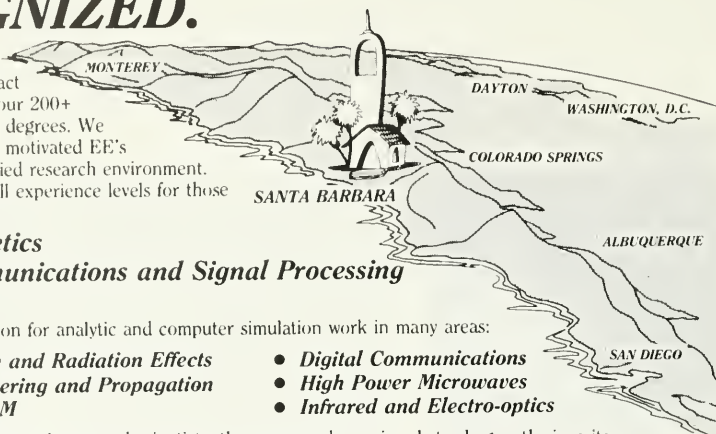
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have announced their intention of using sound in their future productions, either in the form of musical accompaniment or the human voice.

"According to reports about 400 theatres in the country are already showing these sound pictures, at least 1,000 will be doing so by the end of 1928." (November, 1928)

Into The Dark Side

"A new infrared-sensitive motion picture film will permit motion pictures to be made in the dark with infrared illumination, or in the semi-dark without, has been announced by the Eastman Kodak Company.

"With this film, successful motion pictures were made of audience reactions when house lights in a theater were dimmed to 1/70th of normal room illumination." (December, 1952)

Lengthy Railways

"One of [the enterprises underway] is the railroad across Siberia 4,525 miles long, another the railroad from Cape Town, South Africa to Cairo, Egypt, which is 1,000 miles longer than this Siberian road. The Pan-American Railroad, which is intended to connect North, Central, and South America, is a much greater enterprise than either of these and almost equals their combined length." (1904-05)

Sticklers for Accuracy

"The first atomic clock, accurate regardless of age, temperature and pressure, and independent of the earth's motion for its method of time keeping, has been developed by the National Bureau of Standards at Washington." (April, 1950)

Printed Circuits Developed

"Tremendous gravitational forces are exerted on miniature radio equipment when fired in a shell from mortar or artil-

lery weapons. This force approaches 10,000 G's in some cases, and components wired into the circuit in a normal manner are thus subject to being torn from their mountings. This was sufficient reason for the development of printed circuits, but probably of equal importance were the greater ease of mass production and the smaller size.

"Since the war, the National Bureau of Standards and Centralab Division of Globe-Union, Inc., and a few other private companies have continued development of the printed circuit technique with a view to its use in the manufacture of commercial radio receivers and transmitters. . . . Printed circuits will most likely find their widest application in low-power, high frequency radio equipment where small size is an especially important factor." (October, 1946)

Engineering is Everywhere

"Major league batters soon may be swinging with a piece of magnesium instead of ash. Bats made of magnesium with a plastic covering are said to be as good as wood, and the sting following a hit is eliminated." (May, 1962)

Sunless Beautification

"This bundle of loveliness [woman] is benefitting from simulated sunlight produced by the 20-watt fluorescent sunlamp developed by Westinghouse engineers. The tubular lamp emits a concentrated band of radiations in the mid-ultraviolet region of the spectrum (2800-3200 angstroms), which is the erythral, or sun-tan-producing wave length." (March, 1951)

Auto-Adjustment

"Designed to reduce accidents caused during night driving trips, the Techtronic Eye relieves the driver of the tedious task of dimming and brightening headlights. It functions whenever, and only when, the car's 'open-road lighting'

equipment is sent into action. The driver is completely relieved of the task of manually switching lightbeams. Accidents caused by temporary blindness due to headlight glare become minimized." (November, 1953)

High-Tech Production

"A new design for high energy atom smashers and a new way to plan and pre-test them by using an electronic computer were revealed here at the University.

"Precise design and mathematical pre-testing are given credit for this by Professor Donald W. Kerst who supervised construction of the machine.

"Most of the mathematics for the new machine was done with the ILLIAC, the University of Illinois electronic digital computer." (October, 1957)

Energy Alchemy

"The direct conversion of the chemical energy of gases into electricity—long a dream of scientists and for years a laboratory curiosity—has been accomplished here with the development of the first fuel cell capable of economically producing thousands of watts of power. Using hydrogen and oxygen as fuel, the new silent source of power has been developed by scientists at the Research Laboratories of National Carbon." (October, 1957)

Compiled by Sally Cohen, Dennis Francisovich, Shelley Grist, Lesley Lee, Nata Mackevicius, Alfred Tadros, and Joe Wyse. Edited by Mary McDowell.

REALIZING GOALS



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Leonard Chorosinski, Mechanical Engineer, University of Illinois, MSME.

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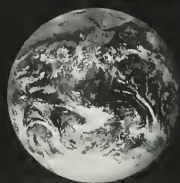
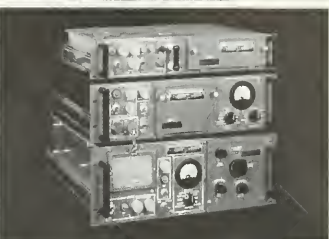
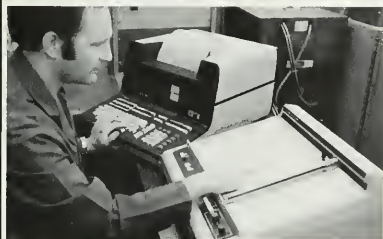
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NAVY OFFICER. IT'S NOT JUST A JOB, IT'S AN ADVENTURE.

From page 7

1. The train traveling against the spin of the earth will wear its wheels out more quickly, since the centripetal force is less on this train.

2. 64.

3. If two widows each have a son and each marries the son of the other and has a daughter by the marriage, this series of relationships would arise.

4. $(4! + 4,4)/(.4) = 71$.

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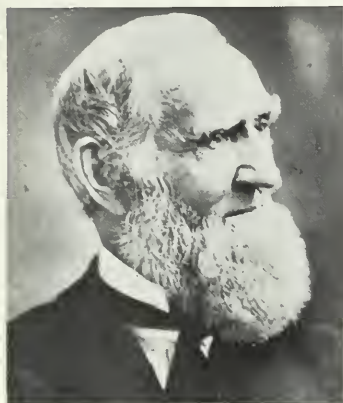
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Jonathan Baldwin Turner led in the movement to ratify the Land-Grant Act which created the University.

Born near Templeton, Massachusetts in 1805, he attended Yale College and studied the classics. In 1833 he became Professor of Rhetoric and Belles Lettres at Illinois College.

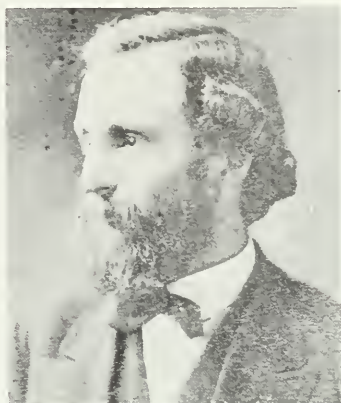
While in Illinois, he became an ordained minister. He also married Rhodolphia Kibbe of Connecticut, with whom he had seven children. His strong religious views led him to be a very vocal opponent of slavery. The trustees of Illinois College, afraid that he would offend some of their generous Southern patrons and thereby upset the college's delicate financial situation, forced him to resign in 1848.

He became a full-time farmer and began advocating "A Plan for a State University for the Industrial Classes," which he first presented in May, 1850. He felt very strongly that the children of the working class deserved an education that was tailored to their aptitudes and interests. Said University President Edmund James, "He early came to recognize the necessity for a scientific education of the practical man, if he was ever to take the place which belonged to him by virtue of the importance of his occupation."

Turner was undeniably a key figure in organizing support in the Midwest for the Land-Grant Act, and some feel his friendship with President Abraham Lincoln, who signed the bill, may have been instrumental in gaining Lincoln's support.

Turner worked to establish his vision of an industrial university in Illinois. He spoke at the opening ceremonies of the University, but would accept no position in the new school.

Mary McDowell



Stillman Williams Robinson was the first dean of the College of Engineering. He assumed his office in February, 1878, when the University was divided into colleges.

A native of Reading, Vermont, Robinson was born in 1838. He worked as an apprentice in a machine shop from 1855-59. He wanted to study mechanics, but no such curriculum existed at the time. Deciding that civil engineering would have to suffice, he traveled by foot the 600 mile distance to the University of Michigan to begin his studies.

He joined the faculty at Michigan in 1866, and in 1870 he became head of the mechanical engineering department at Illinois. In this position, Robinson was the creator of the third mechanical engineering program in the country, preceded by the Massachusetts Institute of Technology and Worcester Polytechnic Institute. He was an unorthodox yet effective educator and set the pattern for future engineering education. He allowed his students practical lab experience and helped establish respect for engineering education among older engineers who thought that their profession could not be taught in a classroom setting.

Robinson left in 1878 for Ohio State University, where he taught mechanical engineering and physics.

Robinson died in 1910, leaving as memorials the clock for the class of 1878, which was originally in University Hall and is now in the Union, and the steam engine in the Mechanical Engineering Laboratory, which he designed and his students built. It provided energy to the University for 25 years.

Mary McDowell

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"Du Pont has been a good experience for me. My first assignment was designing circuit boards for the Automatic Clinical Analyzer. I was proud to be able to double the capacity of a specific memory without a significant cost increase. Now I'm learning a lot of cross-over technology, especially in the mechanical engineering area. The diversity of assignments and opportunities for continued learning make DuPont an attractive choice for EE graduates."

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the human brain might.

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