

the BRIDGE



ETA KAPPA NU

AUGUST '70



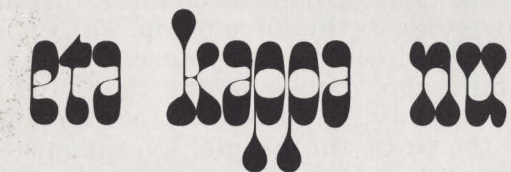
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OUR COVER

Paradise Pond, on the campus of Smith College was named by Jenny Lind when she visited Northampton on her honeymoon. We use this lovely scene to introduce our special supplement. OPPOSITE PAGE: Washington Mews, the picturesque little street that runs behind Washington Square, Greenwich Village, introduces our lead story on the New York Award Dinner.



Electrical Engineering Honor Society

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Los Angeles Award Luncheon will be on August 26th

Real and Imaginary

FIRE FIGHTING

Next time you hear the shrill sound of a fire engine racing along to a local blaze, give a thought to the early days of American fire fighting with its colorful engines and courageous volunteers.

An entire town during Colonial times would turn out for a fire, everyone shouting the alarm to his neighbor who, likely as not, was already shouting the news to the next house; the heavy engine was dragged through the streets; men appeared with axes, chains, ropes, buckets, saws and other tools which might be handy; animals squealed and bellowed, while impossible numbers of boys scurried about vying with one another to be

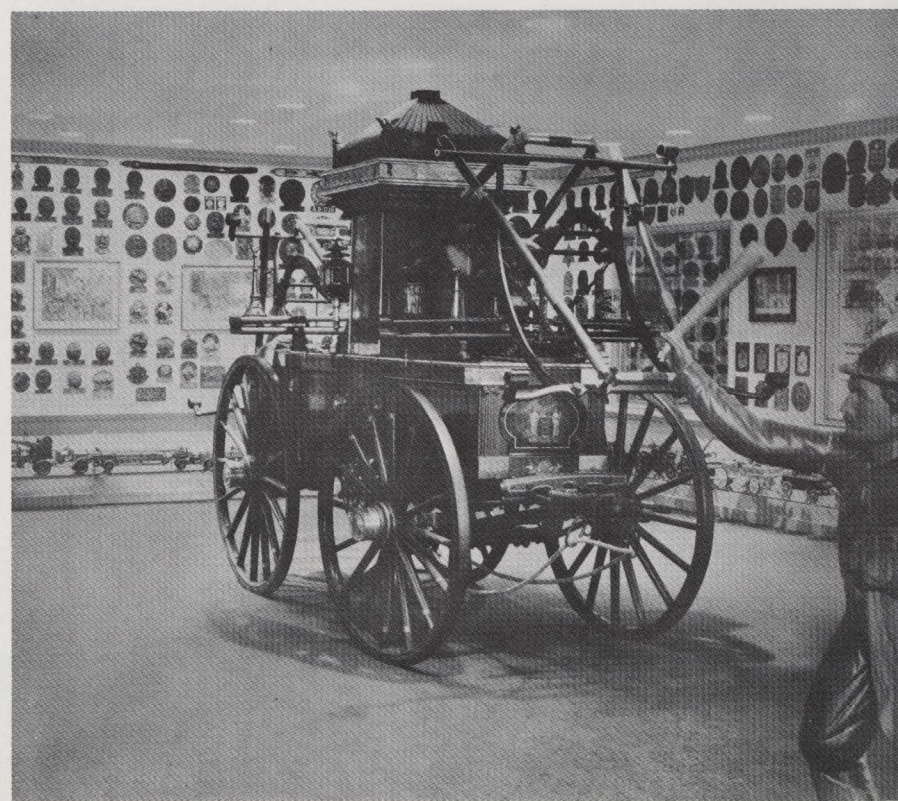
most in the way. Despite such feverish activity, however, the fire was often not extinguished—particularly if it had made any headway at all.

Surprisingly enough, the fire engines used at this time go back to the second century B.C.—and are based on a Greek mechanic's invention of the force pump. The apparatus is lavishly described in several books of the time, and seems to have met all the needs of the people, except one: it had a tendency to fall apart!

During the Middle Ages there was at least variety in the methods of fire fighting, if not much practicality; men alternated between an old standby, the bucket brigade, and the latest innovations: hand squirts and syringes.

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The "Hope" engine of Philadelphia—a double deck Agnew hand pumper built in 1838. When President Cleveland was inaugurated in 1885, this machine was brought to Washington by the Volunteer Fireman's Association of New York City. Later it was part of the parade held in honor of the unveiling of the Statue of Liberty in New York harbor.



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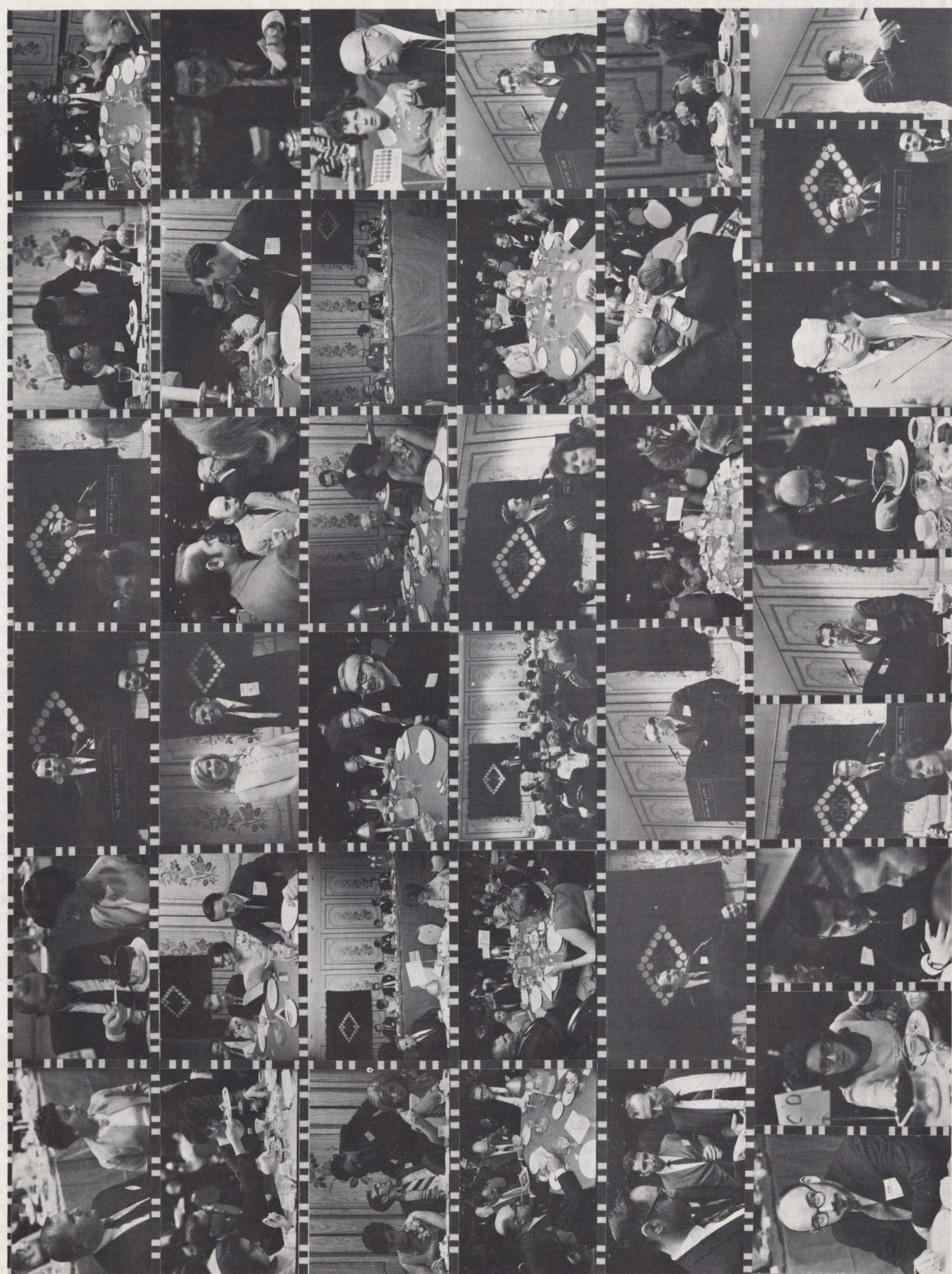
AWARD DINNER

On the beautiful evening of March 23rd, one hundred and thirty-five members and friends gathered in the Sutton room of the New York Hilton Hotel to honor Dr. Robert E. Larson, named by Eta Kappa Nu as the Most Outstanding Young Electrical Engineer in the United States, and the two Honorable Mentions, Dr. Glen D. Bergland and Dr. William G. Scheerer. A cocktail hour social gathering preceded the banquet. The Invocation was presented by Mr. Alton B. Zerby, former National Executive Secretary of Eta Kappa Nu. National President John Hancock served as Master of

Ceremonies, and first introduced the student members from Drexel Institute, that chapter having been named the Most Outstanding Chapter of Eta Kappa Nu for the last year. Dr. Charles E. Hutchinson, Professor of Electrical Engineering at the University of Massachusetts, and former National Director of Eta Kappa Nu, had the honor of introducing Dr. Larson, in recognition of his having nominated Dr. Larson for the award. Dr. Larson delivered a very thoughtful address on the subject: Solving the Systems Problems of the 70's. Many former officers and directors of Eta Kappa Nu

were present, including Past National Presidents Larry Dwon, Roger Wilkinson, and Howard Sheppard. (Apologies to anyone missed). Past National Directors Homes MacDonald and John Tucker again served as hosts for a whole table full of students who were their personal guests. Alan Lefkow, President of the New York Alumni Chapter, Berthold Sheffield, Chairman of the Award Committee, and Thomas Garrity, Chairman of the Dinner Committee, all deserve sincere thanks for an outstanding job, well done.

Photos ▶ 4



The Development of the

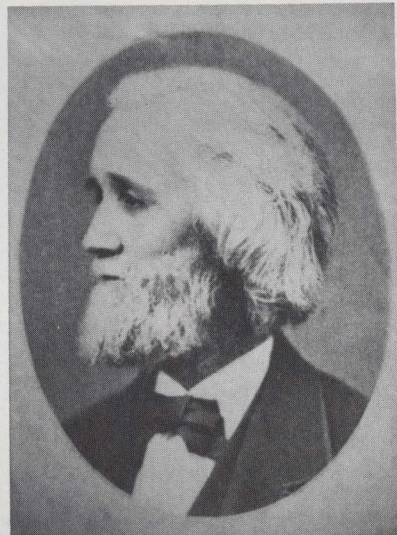
TYPEWRITER

by Allan D. Eckel

The ubiquitous typewriter, indispensable aid to business and the scholar, underwent a prolonged period of development before it achieved the wide spread use and standardized form that we see today. Christopher Latham Sholes, generally credited with the invention of the first practical typewriter, held various positions in public office and in journalistic enterprises during the first part of his life. While holding the office of Collector of Customs in 1866, he became interested with an old friend named Soule in the making of a machine for consecutive numbering, especially on bank notes and pages of blank books. At this time his attention was directed to an article published in an English journal regarding writing by a mechanical device. From that moment he devoted his entire efforts to the idea which has given us the typewriter.

Mr. Sholes provided the bulk of the ideas and labor, and supplied the name "typewriter"; Mr. Densmore supplied the business energy the inventors lacked. The device remained in a crude stage for many years. At one time Thomas Edison who then worked for the Automatic Telegraph Co. was seeking a means for recording messages, and in due course came to examine the Sholes machine. Looking on it with something like contempt, he went on and designed an instrument (patented December 10, 1872 as a "type-writing machine") much different from the Sholes typewriter. Edison put his type on the rim of a small wheel which revolved to bring a chosen letter into position to be printed. A "padded bar" struck the typewheel from underneath, moving it up against the paper to make the impression. Then, instead of the paper moving to

space for the next letter, the typewheel itself moved a space to the right, making it easier to use paper from a continuous roll. The movements of the type-wheel and of the "padded bar" were powered and controlled by elec-



Christopher Sholes

tricity. His machine, however, was more complicated and slower acting than Sholes', but it eventually developed into the stock ticker.

In time Mr. Sholes' work produced something somewhat practical, resembling the form of the typewriter as we know it. It is said that he originally arranged the keys on the keyboard in an alphabetical manner, but it matters little what his intentions were, because mechanical considerations, the sluggish action of the parts, forced him to locate type-bars most commonly used in sequence, farthest apart in the type-basket, so as to minimize their crashing into one another. This resulted in a key arrangement but little

different from the one we use today. By 1876, though only capital letters were provided, the keyboard to be known as "universal" was being put on the Remington Typewriter. It was in 1878 that the Remington No. 2, with the shift carriage for capital letters, was introduced.

We tend to think of the typewriter as a relatively simple device, elementary in principle if sophisticated in detail design, but the article in *Nature* magazine of May 18, 1876 does well in helping us to see it in the context of the time. Excerpts are as follow.

"On looking at the sewing machine or the more novel type-printing apparatus we can see that the ingenuity of America, stimulated by the idea of practical advantage, has been developed in a direction, not towards the discovery of more economic principles, but to the employment of forces already known in the mastery of complicated operations previously thought to be beyond the powers of any other mechanism than the hand of man. The power at the disposal of the operator has not been directed simply to the performance of a single operation . . . but has to be distributed so that it may perform a series of simultaneous operations, all leading to a complicated result. The pressure on any one of the keys of the type-writer, besides the impression which it stamps upon the paper, shifts that paper, inks the type, and places each letter in its proper sequence.

"In order to properly balance all these varied actions, great ingenuity and much practical experience are necessary, and of the 'Remington Type Writer', the only satisfactory instrument of the kind yet brought to public notice, the introducers, the most prominent of whom is Mr. Jefferson

M. Clough, superintendent of the Remington Armoury, tells us that "during the time required to perfect the invention, about fifty machines were constructed, all upon the same general principle, but each differing more or less in the minor details."

The early machine which wrote only in capitals, with a keyboard of forty-four keys, four rows of eleven keys each, is described in detail in this article. It concludes with the following comment.

"The principal question which this beautiful and ingenious little instrument suggests to our minds is, whether it would not be better for every one of us to learn the Morse telegraph language, and employ it for writing upon all occasions instead of the cumbersome letters now in vogue. Thought is more quick than formerly. Germany is rapidly rejecting its archaic type, why should we not go further and write in Morse, where spots and horizontal lines do duty for all necessary signs, and type-writers of the simplest form would be required?"

With time and refinement, the use of the typewriter spread. In 1881 the Chicago Athenaeum, among its various endeavors, taught business courses including instruction on the Remington Type Writer. It is interesting to read the reaction of one of the early users of the machine. Richard A. Proctor wrote of his experience in the London magazine *Knowledge* of November 17, 1882, a journal for which he was employed. He noted the advertisements for the machine in the journal and thought it would be the very thing for him if he could get over the habit of associating mental work with the manipulating of a pen. When Goldsmith tried dictating instead of writing, he failed. He himself had tried to give a lecture for stenographers from the New York Tribune to take down, but he could not lecture without an audience. It was with some doubt, therefore, that he began to try the Remington Type Writer, but he was agreeably disappointed. Without special preliminary practice he found that "in a few minutes one begins to know where the letters are, and not long after one begins to find the way of knocking off the short words almost at a stroke. Though at first the rate of writing is, of course, slower than with

the pen, the work is much pleasanter. The use grows pleasanter with each day's practice, as does the rate of writing." He suggested that a six finger method was used. In his letters to the editor column, "Replies to Correspondents", he began to use the typewriter and found himself answering at greater length than the letters warranted.

Competition to the Remington machine gradually developed and took imaginative forms in deviation from standard typewriter design. Some machines used a type-wheel rather than type-bars. The Munson Typewriter advertised in 1894 that it weighed only 16 pounds in the case; it had interchangeable steel typewheels, 30 keys, 90 characters, and the universal keyboard. Special wheels were available for different languages. This number of characters is large even by present-day standards, and the interchangeability is a decided advantage. Another typewheel machine, the Hammond, first produced in quantity in 1885, used a type material called



The first commercial typewriter

"vulcanite", a sort of hard rubber. Their 1896 advertisement presented the advantages of 12 languages, 37 type styles, weight of only 19 pounds in the case, and speed of 206 words per minute. This last item seems incredible, inasmuch as that speed has seldom, if ever, been attained, even on a modern electric machine. Typewheel

machines were generally considered to be slower.

In 1891 a machine was produced with the Densmore label, which had adjustable ball-type type-bar bearings, minimizing wear and assuring good alignment. The Rem Sho typewriter, made by relatives of the pioneer typewriter makers, was the first to have the type-basket to shift for the capitals, rather than the carriage, a construction later to become almost universal.

One problem with the usual type-bar typewriter was its understroke construction; the type struck at a point squarely underneath the roller, so that the carriage had to be lifted to allow one to see what had just been written. There were several solutions to this, the first successful one being the Oliver in 1894, using a downstroke construction, with two banks of "U" shaped type-bars. This, however, did not provide visibility of a complete line. The next important innovation was the Daugherty Visible, in 1895, the first front-stroke typewriter. It had the form of construction that all type-bar machines have today, but was an elementary sort of typewriter and didn't have great impact.

The Underwood, a pioneer of the front stroke from 1897, had a very significant impact. The article in the November 24, 1900 *Scientific American* notes that it was not radically different in general design and operation from others, but had rapid movement, and a particularly even, light touch. The work was at all times visible, and a tabulating mechanism was provided. Soon production was started on the L. C. Smith, front stroke, with the then still uncommon basket shift; several others also entered the market.

Variations were tried in Keyboard arrangement. The early Hammond offered the "ideal" keyboard which had two rows of keys, convex toward the operator. More common was the double shift carriage, found on most type-wheel machines, the Oliver, and several others. This used only three rows of keys, with letter location conforming to the "universal" order, and with three characters per key. Numerals, special figures and punctuation marks were obtained by use of the Figure Shift key.

5 ♦ Typewriters

Deviating from standard practice in the other direction was the double keyboard. A few early machines, such as the Caligraph, used this, but the best and most successful was the Smith Premier which was introduced in 1890 by Mr. L. C. Smith, the same man who later started the company bearing his name. These typewriters had one character per key, no shift and more than six rows of keys. The lower keyboard was for lower case letters and the upper for capitals. Numerals, special figures and punctuation marks were handled by additional keys in another row or to the side. The Smith Premier was used in business schools along with the other good machines whose names are familiar to us today. Their visible writing model, the No. 10, was brought out in 1908, and in 1910 it won the Grand Prix, over all competitors, at the Brussels International Exposition.

Remington, which introduced typewriting to the world and held early dominance of the market, became the Model T of the typewriter world. In 1906 the machine they were advertising was still a blind-writing typewriter with wooden key levers, little different from the 1878 model. By 1910 they too had a front stroke typewriter, but their position in the market was never the same again.

Typewriter construction was largely standardized by the middle of the second decade of the century, but a few developments should be noted. The December 3, 1910 *Scientific American* describes the Noiseless typewriter which did printing by pressure rather than by impact. This early model used type-bars which slid radially to the printing position. A flat platen in the form of a steel bar was used to provide an inflexible backing, the paper being fed over this by means of a set of rollers of standard construction. The linkage used caused the type-bar to move rapidly at first, but brought it to a stop just as it reached the printing point. Uniform impression was obtained, no matter how quickly or slowly the key was pressed. A double shift carriage was used at first, but later models conformed more closely to standard typewriter design, with the substitution of a system of levers

and pivots for the sliding action.

In 1916 the Hammond company brought out a machine with variable spacing which allowed for different type sizes, making it useful for the preparation of advertising copy, etc. This was the forerunner of the Vari-typewriter, made by the Ralph E. Coxhead Company, and now a subsidiary of the Addressograph-Multigraph Co.

In the May 1931 *Scientific American* there is a lengthy discussion of the Electromatic typewriter, which was the result of work of Russel G. Thompson. Three machines were developed actually; the typewriter proper, a perforator, and a duplicating typewriter which operated from a perforated roll. This was later made under the IBM label. All functions were operated by power applied by a rubber-faced power roller — the carriage return, back spacing, line spacing, shifting, and tabulating.

Refinements on the electric typewriter include the carbon ribbon which provides more sharp and clear impressions; and the variable spacing, found on the IBM Executive, which allows for letters varying in width, providing three times as much space for w and m as for i and l. Finally, in 1961, IBM introduced the Selectric, with the type on a sphere, much akin to a type-wheel, allowing for easy change in type style. This unit moves horizontally across the paper rather than the usual case of the paper and carriage being moved, so we find ourselves back where Mr. Edison thought we ought to be in 1872.

2 ♦ Real & Imaginary

A complete set of fire-fighting equipment of the 16th century consisted of a squirt, three buckets, a sledge hammer and two firehooks. The hooks were used for pulling down burning roofing, and one still hangs ready on a wall in the main street of West Lavington, in England.

In the late 16th century, however, a sturdier fire-pump was introduced with moderate success. An engine of the time consisted of a pump mounted in a tub of water on a sledge. The pump handle was worked

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THE NEXT EIGHT PAGES

It should be well understood that **THE BRIDGE** is not specifically a college magazine. Less than 3,000 of our 15,000 subscribers are college students. The initiation fee of Eta Kappa Nu includes a four-year subscription. At the end of that period each member is given the opportunity of taking a life subscription and the Association derives approximately \$8,000.00 each year from this source. Your Editor has often considered the fact that most of this money comes from members who are young, married less than three years, and with a new baby in the family. Financially speaking, this is the most trying time of life. We have reflected on some of the things that surely must cross the mind of the wife when her husband suddenly says: "Send thirty dollars to Eta Kappa Nu for a subscription to **THE BRIDGE**." She visualizes a whole new outfit for the baby, or perhaps a pretty new dress for herself going down the drain. For this reason, among others, we have tried to make **THE BRIDGE** a family magazine that everyone could enjoy. That we have succeeded in some measure is evidenced by the numerous letters that we get from the ladies (such as the letter from Mrs. Grace Hudowalski that we printed on page 23 of the last issue). **THE BRIDGE** now takes great pride and pleasure in presenting a special supplement entitled **HIGHER EDUCATION AND THE AMERICAN GIRL** that we have prepared especially for, and in honor of, those good and noble wives of Eta Kappa Nu. The pretty girl on the opposite page is Miss Jacqueline Craig, on her graduation day at Christian College for Women, Columbia, Missouri.



Higher Education And The American Girl

AN INTERPRETATIVE HISTORICAL OUTLINE

by
Prof. Paul K. Hudson
Editor, Bridge

Education for girls was so slow in developing and of such little interest that no history was ever written. It is now too late as many important documents have been lost.

DARKNESS AND DAWN

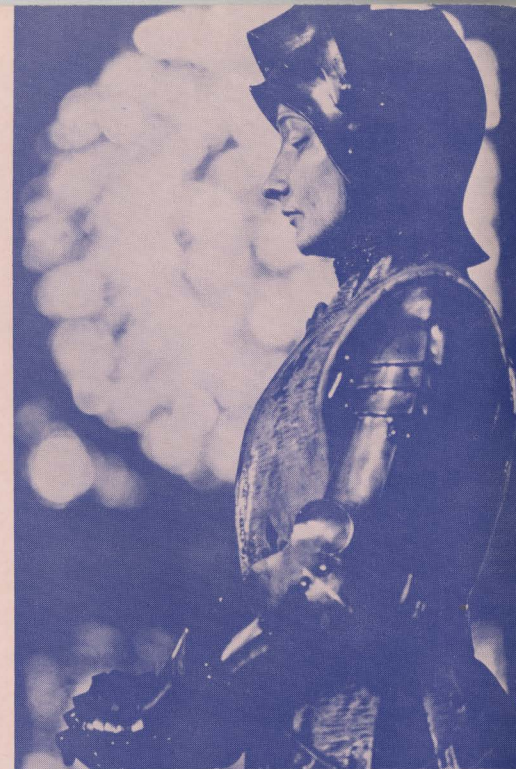
Life is a vast desert, and Woman is the Camel that gets Man through it. This proverb of ancient Arabia seems paradoxical when we remember that Arabian women were the most taken-for-granted people on earth. The men were capable of breathtaking artistic communication, especially during the years they occupied the Iberian peninsula, but their women were treated as **absolutamente nada**—absolutely nothing. In a time and place of great scarcity it might take two horses to buy one choice woman, but when the caravan reached the water hole the horses drank first and the woman last. But lest we lean on the Arabs too heavily, we will do well to remember that throughout all of the world and all of history down to the nineteenth century, woman had a status approximating that of a domestic animal. Man was aware of her functional merits, but he did not consider that she had any intellectual capacity at all. Occasionally an individual woman would dispute this, much to her later sorrow. Thus on a day in March, 415 A.D., beautiful and talented Hypatia was torn to pieces by a street mob because she dared to lecture on Mathe-

matics at the University of Alexandria. On another day in 1431, the most famous teenager of them all ended up decorating a bonfire in full and final payment for showing too much courage, leadership, and a number of other things that were reserved exclusively for men. To this very day many of the women of the world are considered to be grossly inferior and are denied even the simplest privileges enjoyed by men. In the United States, however, the status of women has been improved so much during the last century that there is a distinct possibility that they may one day become fully accredited second-class citizens.

WHY DON'T YOU SPEAK FOR YOURSELF PRISCILLA?

When the English colonists settled in America, they brought with them their traditional ideas of women. When a woman married (as they all did—after all what choice was there?), the old English common law was: **Husband and wife are one and the husband is the one.** The wife could hold no property and was not recognized by the law as a person. Even the children were the property of the father. As for the right to vote, the law everywhere read: **No one shall be denied the right to vote except lunatics, murderers, traitors, and women.** That is what is called "getting put in your place."

The rules for educating women were also borrowed from



And Joan the sweet maid of Lorraine
Whom the English burnt at Rouen, where,
Where is she, sovereign Virgin?
And where are the snows of yesteryear?

the English traditions. The woman's place was in the home—especially the kitchen and one other room. Her purpose was to produce and attend to the necessary wants of a quiver-full of children that would populate the wilderness. She would do none of the country's work that required book knowledge and so her intellectual education could be properly neglected. Occasionally someone would suggest that maybe women ought to be able to read and write, but others would quickly point out the great danger in this as the women would immediately start forging their husbands' names to various things.

Elementary schools were established in most of the colonies, but girls were never permitted to attend. Small girls could attend **Dame Schools** where they were taught a little reading, sometimes a little writing, but no arithmetic. The daughters of well-to-do southern planters were often instructed in their homes and then sent to England to finish a questionable education. Shortly before the revolution a few English-type boarding

schools were established for well-to-do girls, but the academic programs were more needlework and deportment than thought and study. Prior to the revolution there was no education at all for poor girls anyplace in the colonies.

EITHER HANG TOGETHER OR SEPARATELY

After six devastating but successful years of war, the now free and independent states gradually adopted a more tolerant attitude regarding the education of girls. The town elementary schools were opened to them, at least during certain hours of the day and, in addition, a new type of institution sprang up. It was a kind of secondary school called the female seminary or academy. Many of these had Charters of Incorporation. The first one was **Mr. Poor's Academy** in Philadelphia (1787). Some of the most noted were **Byfield Academy**, **Ipswich Female Seminary**, and **Wheaton Seminary**. In addition to the primary branches of grammar, geography, etc., they gave instruction in more advanced subjects such as mathematics and languages. They were not under any circumstances to be considered as colleges, and the costs involved eliminated all but the most well-to-do girls. To make something available to the poor girls, a number of private seminaries were established, but their facilities and teachers were so inferior that there was some question as to whether or not they were better than nothing. The day of the free public high school had not yet dawned, and college education for girls was unheard of. Thus in the early years of the nineteenth century, the girls of America were in desperate need of leaders—champions of their cause—who would be giants of courage, imagination, and determination. They did not have to wait long.

THE FIRST TRIUMVIRATE

The revolution had been a great turning point, and the

war between the states would be another, but the time was **now**—the need was **now**. The stage was set, the house-lights dimmed, the curtain drawn, and three great performers were ready for their dates with destiny. Their names were Emma Willard, Catherine Beecher, and Mary Lyon. How does one evaluate these three great ladies who promoted and, to a degree, ruled women's education between the wars? They were similar in many respects and different in others. All saw the need, and all saw the only possible solution. Girls had the right to a quality education, and the only way the rank and file could receive it would be through endowed and tax supported institutions. There was no disagreement



Emma Willard



Catherine Beecher



Mary Lyon

here. Yet, seeing the truth is one thing, and promoting it is another.

Emma Willard (1787-1870) is noted and remembered for two important efforts. She wrote the famous document entitled **An Address to the Public; Particularly the Members of the Legislature of New York Proposing a Plan for the Improvement of Female Education.** Her composition was well received because it was factual, defensible, and unemotional. Although the New York legislature did not respond in a financial way as had been hoped, the pamphlet was read both in America and Europe and stirred general interest and approval. In addition Mrs. Willard established the renowned **Troy Seminary** in 1821. Lafayette made a special visit to the seminary in 1824 and

later, when Mrs. Willard was in Europe, he invited her to the Chamber of Deputies and various court functions.

Catherine Beecher (1800-1878) was the sister of Henry Ward Beecher and Harriet Beecher Stowe. She founded several schools for girls, notably the **Hartford Female Seminary (1822)** and the **Western Female Institute (Cincinnati 1832)**. She was convinced that no school for girls could succeed unless it had heavy endowment, and she spent a good part of her life promoting such endowments. Her concept was almost exclusively the training of teachers, and she is most remembered for supplying many of the needed teachers for the West.

Mary Lyon (1797-1849) was born with an overpowering, self-sacrificing, religious zeal that never moderated. She had hoped to found a seminary for girls with the help of the Church but was forced to give it up when the ministers stated that education for girls was unwise and not indicated by God. Her primary concern was the education of poor girls. She knew that this was not possible without public support, and she spent much time in campaigning. In addition, when she finally started her seminary, she organized it along lines of complete frugality in everything except quality of instruction. The girls were expected to do the domestic chores of the school, and the teachers were to consider themselves as missionaries and work for nominal pay. Catherine

Beecher took sharp issue with her on this point. Mary Lyon was born in poverty and, by choice, lived and died in poverty in order that she might establish and successfully promote that very illustrious institution **Mount Holyoke Seminary** (1837). Mount Holyoke College stands today as her everlasting monument.

These three great ladies gave of themselves to the cause they believed in without any ulterior motives whatsoever. None was seeking fame, or needed to make her own employment, or had any children that wanted educating. From the personal standpoint, however, they were all quite different. Emma Willard was the **Grand Lady**—beautiful, charming, and talented. She was glorious even in defeat. Catherine was the quiet plodder. She had the wisdom to see the immediate problem, and the determination to solve it. She did not hope for a wider sphere of activity for women in general; to her, suffrage for women was unthinkable. Mary Lyon was the delightful roughneck. Careless in dress and manners, had it not been for her great spiritual devotion she would have made an excellent drinking companion for any W.C. Fields of her day. But spiritual devotion she did have and, in addition, a dazzlingly brilliant mind. On one occasion, upon finding that she needed some Latin, she learned the entire Latin grammar in a single weekend. On another occasion, when the school bakery ran out of yeast, she went into the chemistry laboratory and manufactured a yeast substitute that **worked just fine**.

The First Triumvirate did not, of course, advance the cause of women's education in a complete vacuum, but it did stand for integrity, a commodity that was in very short supply at the time. It paved the way to a great extent for the Second Triumvirate which would, at the close of the Civil War, establish high-quality colleges for girls at Poughkeepsie, Wellesley, and Northampton.

MEANWHILE BACK AT THE RANCH

Before proceeding farther in time, it will be helpful to discover the conditions of girls' education elsewhere in the country. For reasons of geography and diversity of effort, the country should be divided, like **Omnia Gallia**, into three main parts.

The South. The standards of education for girls in the South prior to the Civil War are extremely difficult to determine because of a general lack of reliable information. Often schools that were concerned mainly with needlework and deportment would call themselves colleges, or even universities, and sometimes grant degrees. The first of these was Mississippi College which was founded in 1830 and conferred degrees on two ladies in 1832. However, Georgia Female College which was not chartered until six years later claims to be **the oldest regularly chartered institution for conferring degrees upon women in America, if not the entire world**. One of the better schools for girls in the South was Mary Sharp College of Winchester, Tennessee (1851). Although there were some coeducational schools, it was apparent that the South preferred that girls be educated separately.

The West. Ohio University at Athens was the first college west of the Alleghenies having been established in 1803, but its first woman graduate was Margaret Boyd of the class of 1873. The first college worthy of the name that was open to girls was Oberlin. Founded in 1833 as Oberlin Collegiate Institute, it welcomed girls from the very first. The **ladies department** as it was called continued for some years, but in 1838 girls were also admitted to the regular program. They were the first real coeds. Here was a distinct epoch and probably marked the first time in American history when girls were enrolled in a strong college curriculum. They were not numerous, however, as only 79 had received the regular AB

degree by the time of the Civil War. By mid-century there were a number of other private colleges that admitted girls. They include Antioch, Muskingum, Mount Union, and Lawrence, among others.

The East. Although the East pioneered quality private seminaries for girls and colleges for men, it was not inclined to establish either public or private colleges for girls. It was not until April 13, 1855, that the first institution that could seriously claim to be a college for girls was established at Elmira, New York. It had a fine program—easily a full cut above the seminaries—but there was and is considerable dispute as to whether or not it was a real college. Certainly it was not comparable to the mens' colleges. Ten

years after its founding, it had a faculty of seven and only 74 in the college program.

Mary Lyon had hoped to establish a college when she founded Mount Holyoke, but she knew that she had not done so at that time.

TURNING THE POINT

Mid-century and after was a time of change and crisis. A man's traditional horizon (meat, potatoes, shelter, and a girl) was shattered by some important social questions. Harriet Beecher Stowe's book **Uncle Tom's Cabin** was nothing short of an explosion, and Darwin's **Origin of the Species** which disputed divine revelation was a blow so violent that the civilized world never recovered. The situation regarding the education of girls was improved considerably by the

establishment of many public high schools and normal schools. These more or less eliminated the need for seminaries. The time was now definitely appropriate for the establishment of colleges for girls, but they had to wait a few more years. A more immediate and pressing problem had to be settled first.

UNDER THE SOD AND THE DEW

The cloud which had appeared dark on the horizon in the thirties had grown to a thunderhead in the fifties, and in the sixties the storm had burst. Nothing could have been worse for the soul of the nation or better for the individual rights of women. Men teachers had been taken by the army, to be replaced by women, thereby accentuating their

value and need for training. Moreover, during the long years of the war, women had the doors of their cages unlocked and were called upon to run farms, care for the wounded, and a host of other things that needed doing. In short, women were discovered to be people. Nevertheless, the financial problems associated with the war prevented the establishment of any colleges for women (except Elmira).

WILD ROSES OF CAPE ANN

The critics who so loudly proclaimed that women had no intellectual dimensions were partially silenced by some very amazing women who came upon the scene at exactly the right time. Mrs. Stowe was one of them. The most interesting one, however, was **the little girl who came skipping down**

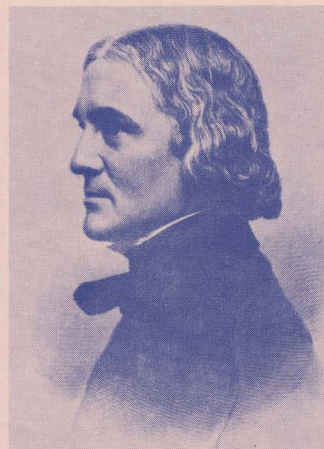




Lucy Larcom



Matthew Vassar



Henry Durant



Sophia Smith

the lane bearing wild roses of Cape Ann. Her name was Lucy Larcom. Born on poverty flats, the family was made destitute by the death of her father when she was six years old. At eleven, she was sent to the mills of Lowell as a child laborer working thirteen hours a day for \$1.25 a week. It took only two years of this to break the little girl's health, but they were never able to break her spirit. She was determined to better herself and took every moment she could to read and study. Lucy joined with other mill girls in publishing a magazine called **The Lowell Offering**, containing creative prose and poetry written by the girls themselves. The magazine stirred the imagination of the world, and the subscription list rose to four thousand. An anthology from its pages was published in London, and lecturers in Paris discussed **The Significance and Merit of The Lowell Offering**. Lucy worked her way through Monticello Seminary as a member of the faculty and then became a teacher of Composition, History, and Moral Philosophy at Wheaton. She closed out her life as a distinguished professional poetess. **The Poetical Works of Lucy Larcom**, published by Houghton, Mifflin, and Co., contains 284 of her poems with 97 under the title **Wild Roses of Cape Ann**.

NOW LISTEN TO THIS MATTHEW

With all due respects to

Elmira (and we will try not to get arrested in that town), Vassar College was the first right-handed college for girls in America. The difference between them, however, was basically a matter of money. Elmira was established with about \$80,000 and Vassar with exactly ten times that amount. There was very little romance in Vassar's founding, and, except for his money, it would be difficult to find a less suitable person than Matthew Vassar to found the first or any college for girls. A professional educator named Milo Jewett did a first-class brainwashing job on Vassar to shake him loose from his money. There were other various and sundry people working Matthew over at this same time, and Milo had to undo their work at regular intervals. Even after the college was founded, Jewett had to wring the promised money out of Vassar to put into the hands of the trustees. But lest we be too hard on Matthew, we can say in his favor that he was an honest, honorable, and God-fearing man who sincerely wanted to do the right thing. He certainly made an excellent showing considering the small chance he had in life. Also, he had some wit. When asked about the propriety of establishing a college for girls with money earned from selling beer, he replied that it was **mighty good beer**. The college was chartered in 1861 but did not begin classes until 1865. From the

beginning it was not intended to be a place for poor girls, but remembering Vassar's rule that the girls had to wash themselves once a week, it might have been a little gamey in the Springtime.

AND THEN THE DIKE BROKE

Ten years later two more well endowed colleges for girls were established. Sophia Smith founded Smith College, and Henry Durant founded Wellesley. The softening of public opinion during 40 years and a war can be seen from the dissimilarity of the problems of Mary Lyon and Sophie Smith. Mary was stiff-armed by the church, and Sophia was pursued by it, in the matter of establishing a Christian college. Durant founded Wellesley as a memorial to a young son who died. Smith joined Vassar as a college for the well-to-do, where students would not do servant's work, and Wellesley joined Mount Holyoke as a college that would include the rank and file. About this time the dike broke completely and higher education for girls became an accepted part of life. Bryn Mawr, Lake Erie, Stephens and many other fine colleges for girls were either founded or converted from seminaries. Women's colleges affiliated with men's colleges were quickly formed. The first ones were Sophie Newcome at Tulane (1887), Barnard at Columbia (1889), and Radcliffe at Harvard (1894). The coedu-

cational state universities sprang up everywhere except in the East. It remained only for college administrations to determine what kind of people women really were so that they would know what kind of education to make available to them. They are still working on that problem.

SHALL I COMPARE THEE TO A SUMMER'S DAY?

Psychologists have attempted for many years to determine the true nature of woman—how does she think—where does she get her strength—what are her capabilities? Although their work is still preliminary (and always will be), they have discovered some interesting truths.

First, there is no natural intellectual difference between the sexes. Boys are found to be able to learn scientific subjects faster than girls, and girls are more proficient in oral and written communication. These differences, however, are caused mainly by social interests rather than by natural ability. Also, they are not as great as the differences between the boys themselves and the girls themselves.

Second, although women bear the children, and are likely to continue to do so, this one arrangement, along with its necessary physiology, logistics, and accouterments, is the only natural difference between the sexes. All other differences, and there certainly are bucketsfull of them, are chargeable to sociological causes. There are no natural reasons that prevent girls from being interested in Karate and boys from being interested in flower arranging.

We conclude from this that girls are not inferior and do not need a watered-down curriculum. On the other hand, it would be a mistake to assume that there should be no differences at all. Certainly the life patterns of men and women are different, and this indicates some differences in academic needs. The woman's early adult life must be bounded largely

by the problems of the home; while at this same time, the man is addressing himself to the problems of vocational advancement. Later in life, the woman has more time for the activities of the world in general and the man for the home and its particular charms.

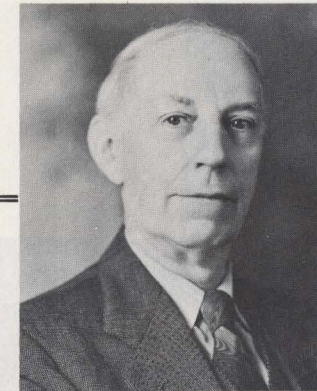
What, then, are the goals of education for girls? The most often mentioned are these: Intellectual expansion and discipline, individual awareness, social consciousness, vocational training, transmission of the cultural heritage, creative expression and appreciation, and competency in family responsibilities. To paraphrase, the educated woman will (1) have intellectual—spiritual—social—moral values, (2) know how to raise a family and (3) be able to engage in gainful employment when the time is available or the need indicated. If we reverse the emphasis on the last two, the statement applies equally well for men.

THE ODDS AGAINST TOMORROW

Of all the girls in the world, the individual American girl has the best chance for an education and a pleasant, useful life. Yet it is perfectly obvious that society in general and the educational establishment in particular has stacked the cards. Boys outnumber girls by a large percentage at the college level. As a corollary of sorts, we find that less than ten percent of the listings in major biographical directories are women. In addition, it might not be inappropriate to ask if the colleges are really pursuing all of the broad general goals previously stated. At Vassar, for example, the girls are permitted to "entertain" men in their bedrooms all night—a standard of moral behavior below that required in the cheapest flop-houses.

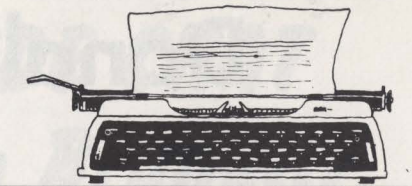
The earliest concept of education involved the development of the manual skills. This is now gone from the college scene except in certain secondary school teacher education

programs. It was replaced by the various liberal arts and professional programs developed as separate entities and ends in themselves. The education market of the present century was thrown into turmoil by two big-ticket items—John Dewey and Robert Hutchins—in that order of chronology and relative importance. Dewey believed that the curriculum should be built around the present-day personal and social needs of the students. Hutchins thought that education should be derived from a study of the works of famous authors and a development of one's own competence in verbal and symbolic communication. The fairest statement that can be made is that they were blindmen touching an elephant. Education, of course, is all of this and much more. It must combine the liberal arts with a solid professional discipline in such a way as to explore the dimensions of the human spirit. In this atmosphere the student will (1) develop a sense of value judgment, imaginative interpretation, and creative synthesis, (2) be able to learn, understand, reflect, and transfer, (3) have intellectual poise and integrity and (4) come to terms with the Divine Spirit. Man is the only animal with a conscience; the only one that understands a little of the meaning of life; the only one that wonders at the eternity out of which he so recently came and into which he will so soon depart; the only one that has the need to search for truth, beauty, goodness, and love. If education is to have real merit it must establish itself at these levels rather than at the lower strata of social adjustment and dexterity of communication. Unless colleges—including especially colleges for women—start taking a more lofty view of the human race, the twenty-first century will dawn with the citizenry emotionally overwhelmed by the immense social and technical problems that are certain to be presented.



LETTERS

from Ellery



The Ancestor Problem

Did you have two parents? Of course you did. And did each of them have two parents? Certainly. Well that makes six ancestors that you probably can remember. Then how many did you have going back just to the time of Christ? That would be two to the sixtieth power, if there are three generations per century. And how would you find that number?

As a boy (about 80 years ago) I learned that "Involution" the "power of a number" may be expressed in an indefinitely large number of ways. I chose to say that:

$$2^{60} = 1,024^6$$

There are other ways of expressing the value of two to the sixtieth power but I selected this one because the multiplication of 1,024 involves only six products. So yesterday I sat with pencil and paper and worked in the old way used before Logarithms, Slide Rules, and computing devices were brought forth. My sister Olive once or twice looked at me with smiling face and I wondered if she wondered what I was doing. But when I asked her if she had asked me a question her reply was "Did you notice who got the prize in the Rose Show?"

When at last I found the value of

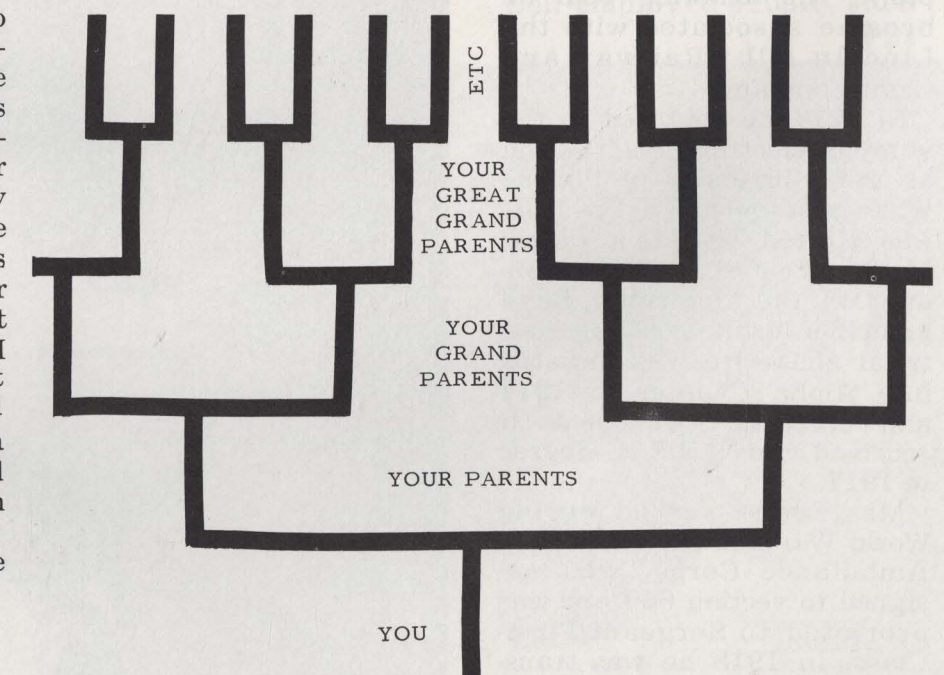
$1,024^6$

it turned out to be
1,152,921,504,606,846,976

I then found the value of
2 60
the hard way and it was the same number so I knew that there was no mistake. Had I used Logarithms or a slide rule as engineers do for most of their computations I would have had nothing but zeros for all the places except the first four or five at the left. I think you will agree that this is a lot of ancestors—more than a million trillion, since the time of Christ, two thousand years ago. If every bit of the solid surface of the earth were used for graves there must have

been 34,000 of your ancestors buried in each grave measuring three feet by eight feet. Actually modern man goes back at least 15,000 years and on this basis you would have had trillions of trillions of trillions of ancestors, if each one had two parents. How do you explain this especially when you consider that Historians say that there have been only a few billion people on earth in its entire history? If you have any comments please pass them along to me.

Ellery Paine.
Eminent Member



Donald Grover Evans

1887-1970

Donald Grover Evans, past National President (1922-23) of Eta Kappa Nu, died in White Hall, Illinois on Friday, 30 January 1970 at the age of 82.

He was born in Larned, Kansas, 17 November 1887. At an early age he moved with his family to White Hall, Illinois after the death of his father. He received his early education in White Hall. After graduation from high school there he attended the University of Illinois for a semester but was forced to leave for financial reasons. In 1907 he began his career working for the Wagner Electric Manufacturing Company, St. Louis, Missouri where he performed transformer testing. In 1908 Mr. Evans was employed by the Clarksville (Tenn.) Railway and Light Company but returned in 1909 to the employ of the Wagner Electric Manufacturing Company. The following year he became associated with the Lincoln (Ill.) Railway and Light Company.

In 1913 he returned to the study of electrical engineering at the University of Illinois. While a student at U. of I. he was elected president of his freshman class, business manager of the University Band and chief engineer of the electrical show. He was initiated into Alpha Chapter in 1917 and served as its president. He received the B.S.E.E. degree in 1917.

Mr. Evans served during World War I in the U.S. Army Ambulance Corps, was assigned to section 609 and was promoted to Sergeant-First-Class. In 1918 he was transferred from that unit to the

aeronautical service, made instructor at the Aviation Ground School at the University of Illinois where he held a brevet commission as Captain of the Illinois National Guard.

In 1919 he began his long association with the public utilities industry in the employ of the Wisconsin Gas & Electric Company as the company's first graduate electrical engineer. He first worked in the company's Kenosha district office, transferring to Racine in 1921. He served as the chairman of the electrical section of the Wisconsin Utilities Association in which he also

was chairman of the Rate Committee. Mr. Evans played a major role in bringing electric power to the rural areas of southeastern Wisconsin during the 1930s. He retired as a Vice President of the Wisconsin Natural Gas Company in 1956.

In addition to serving the brotherhood as National President, he also held the positions of Vice President, Treasurer, and Editor of the Bridge (1919). His other professional affiliations included A.I.E.E. and Sigma Tau.

Mr. Evans had strong interests in several hobbies including genealogy, woodcrafts, and

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THE JOB SITUATION IN 1975

With all the technological and social developments underway, what kind of jobs can we expect? Between now and 1975, we can expect to see the total number of jobs in the United States increase about 15 million to approximately 90 million workers. Our population will increase from its present 200 million people to at least 230 million.

The number and types of jobs will depend on many events. For example, whether we have war or peace, it will depend on new discoveries, what goes on in Washington and even more so it will depend on consumer preferences, on what people like to buy. Technological developments will have a strong influence on jobs as it has been doing.

Let's get the single piece of bad news over with first. By 1975, we expect to have 800,000 fewer people working on the farms. In mining, except for places like the Iron Range, employment will just about hold its own with no change in the number of jobs in 1975 from the number we have now.

A FIRESIDE CHAT with Cleo Brunetti

Now for the others. In the construction, that is, building homes, schools, highways and industries there will be an increased number of jobs, which will just about balance the drop in agriculture. In other words, approximately 800,000 more jobs. In manufacturing, we can expect 2 million more jobs in the United States. In transportation and public utilities, another 400,000 jobs. Transportation includes bus, airplane and rail service. Public utilities are the gas, oil and telephone companies. These industries, while increasing only by 400,000 jobs between now and 1975, will actually reverse what used to be a downward trend. In finance, banking, insurance and real estate, we can expect an additional 600,000 jobs by 1975.

Now, we come to the real big changes. First, 3 million of the 15 million new jobs between now and 1975 will be in ser-

vices. These include educational services, publications, radio and television, beauty culture, medical and health services, auto services, repair of household appliances and other jobs like operating restaurants, hotels, motels and resorts.

The wholesale and retail trade business will have 3,300,000 more jobs in 1975 than we have today. Included are every type of wholesale and retail business such as supplying and operating supermarkets, clothing stores, and everything from buying and selling a stick of gum to an automobile. The retail trade will probably grow faster than the wholesale trade. The fastest growing segments of the retail trade will probably be in those providing food, drugs, automobiles and parts, discount houses and shopping centers will rise substantially.

Self-employed people, such

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The Outstanding Student Award

By L.E. Hamilton
Chairman
Student Award Committee

The 1970 Eta Kappa Kappa Nu Student Award Program started its sixth year in November with the mailing of a letter to every college chapter in The Association reminding them that they would be officially solicited for a nominee in December.

As in years past the official kickoff of the program started on the day after Christmas with the mailing of the official solicitation to all college chapters in The Association asking each chapter to submit one nominee for the award, though membership in either Eta Kappa Nu or the chapter's school is not mandatory. The student is nominated on a questionnaire supplied by the Student Award Committee, and is countersigned by the head of the Electrical Engineering Department of the candidate's school, verifying the factualness of the replies. In addition to the questionnaires, at least two confidential letters of recommendation from prominent faculty members of the student's school are requested by the Chairman of the Student Award Committee.

As of March 24, 1970, the following schools had submitted entries.

Auburn University, William Crenson Willis II; Bradley University, John Curtis Gibson; California State College at Los Angeles, Eugene Robert Worley; Colorado State University, Gary Paul Antweiler; Drexel Institute of Technology,

Mitchell Irving Mirkin; Duke University, Kenneth Houston Pugh; Georgia Institute of Technology, James Martin Hertenstein; Illinois Institute of Technology, Thomas Francis Gannon; Kansas State University, James Dean Weichel; Massachusetts Institute of Technology, Steven Cull Carhart; Michigan State University, Patrick Leslie Colestock; Michigan Technological University, Ronald Nevin Buswell; Newark College of Engineering, Edmond Walter Israelski; New York University, Soterios Cosmas; North Carolina State University, George Ray Ritchie; Northeastern University, Dave Irwin Schonbach; Ohio State University, Roger Duane Ahlberg; Pennsylvania State University, George Edward Soltysik; Polytechnic Institute of Brooklyn, Bernard S. Mezrich; Purdue University, Larry Ernest Gray; Renssler Polytechnic Institute, Robert E. Reinovsky; Texas Technological University, Emanuel Marvin Honig; University of Arkansas, John Carol Vaughan; University of California-Santa Barbara, Robert James Farley, Jr.; University of Cincinnati, Wayne L. Naseman; University of Florida, Gary A. Pitt; University of Iowa, Daryl Peter Slaviero; University of Maryland, Robert Morgan Rast; University of Michigan, Barry E. Austin; University of Missouri-Columbia, Ronald Howard Hodges; University of Missouri-Rolla, George Marrill

Vernon; University of Notre Dame, John Charles Fravel; University of Tennessee, James Clayton Hager, Jr.; University of Texas at Arlington, Robert Warren Alford; University of Toledo, David Elwin Olin; Villanova University, Peter John Avioli; West Virginia University, Robert Edward See; Worcester Polytechnic Institute, Alan Paul Zabarsky; Princeton University, Newton Hudson Bullard.

The Student Award Committee again is having its annual monumental task of attempting to make a selection from among the above mentioned list of extremely fine entries that have been received. All of the entries meet the basic criteria of the Outstanding Electrical Engineering Student which may be defined as "Outstanding by virtue of his scholastic excellence and high moral character; coupled with demonstrated exemplary service of his classmates, university, community and country."

The winner will be honored at a special Wescon luncheon to be held in Los Angeles on August 26th, at the Los Angeles Hilton Hotel.

**Everyone Welcome
Student Award
Luncheon
August 26th**

Letters to the ... EDITOR

BRIDGE continues to receive mail concerning our special supplement entitled COMPUTER ART that appeared in the February issue. We have enjoyed it all, including the following letter that brings us up short:

Dear Sir:

When Masfield wrote "Sea Fever" he wrote "I must down to the seas again-----." He did not write "I must GO down-----." A small point to be sure, but if we're not one up on the B.A. types, we're one down, and in a contest of Two Cultures that puts us last.

Sincerely, Peter Duncan

Dear Peter:

I never had the pleasure of meeting Masfield (he had left the Greenwich Village saloon before I got there) but otherwise I know him a little and only a moment's reflection brings me to the realization that your version probably is the correct one. If the author had been Wordsworth then my version would most certainly have been the correct one, but your version sounds more like Masfield.

My only defense is that I never print anything artistic in BRIDGE without holding the book on it. Therefore, I quite naturally referred back to my source. It turns out that my personal library has three books that contain the poem. The first one, and it is the one I used, is Ralph L. Woods' "Treasury of the Familiar." Here is a photo of part of the page and, well, take a look for yourself:

I must go down to the seas again, t
And all I ask is a tall ship and a sta
And the wheel's kick and the wi

The next one is Louis Untermeyer's "Treasury of Great Poems," and you may again be interested in seeing part of the page:

I must go down to the seas again, to the l
And all I ask is a tall ship and a star to ste
And the wheel's kick and the wind's se
shaking,
And a gray mist on the sea's face and a gr

However, the last one is Speare's "Pocket Book of Verse and, as you can see, he got it right.

I must down to the seas again, to the
And all I ask is a tall ship and a star
And the wheel's kick and the wind

I appreciate your generosity in saying that the error is a small one but I expect that Masfield would not take very kindly to people who edited his work to make it sound like Wordsworth. Also, it must be admitted that the omission or substitution of a small word can change a great deal of the flavor and meaning of a composition. Some time ago I was invited to a private home to hear an album of recorded recitations by some very famous literary people. From the beginning I had the impression that they were just reading words for money and this became a conclusion when one of them demonstrated that he was so unfamiliar with "Grecian Urn" that he couldn't even read it right out of the book. In the line "For ever wilt thou love, and she be fair" he substituted the word "is" for the word "be" and at the same time I heard a strange noise that I realized was Keats softly cursing in his Roman grave. So lets not give any thought to the B.A. types.

Cordially,
Paul K. Hudson, Editor

19 ♦ Brunetti

as lawyers, doctors and dentists will increase by 1,800,000 in the United States.

And now, believe it or not,

the biggest increase in jobs; namely, some 4,000,000 of the 15 million between now and 1975 will be in government. This time it's not the Federal Government who will be doing most of the hiring, but the state and local governments. Although we expect the jobs in the Federal Government to increase slightly by 1975, the increase will be limited by the expanding use of electronic data processing equipment, copying devices and other labor-saving equipment. The Post Office Department, swamped as it is today, represents over one-quarter of all Federal jobs. The outlook is that the number of jobs will remain about the same due to the increasing mechanization of mail handling equipment. If we don't start mechanizing the Post Offices faster, we may have to give them up entirely for it's getting to the point where the employees are unable to cope with the torrent of material flowing through the mails. Likewise, the Department of Defense which accounts for over 40% of the total Federal employment will probably level off and by 1975 should be down if we do not have another emergency.

Because of the increasing requirements in state-sponsored educational institutions, in the size and number of hospitals and in state highway work, we can probably expect a million more of these and other jobs in state governments by 1975. First place in new government jobs, however, will go to local governments where we can expect an increase of 2-1/2 million jobs or 50% more than we have today. Local government covers all government which is paid for by local taxes. This includes schools, colleges, police and fire protection, streets, sewers, public buildings, health and welfare services, parks, and all city and county administrative, office and highway personnel.

CHAPTER NEWS

THETA CHAPTER, University of Wisconsin—During the past year Theta Chapter has been working closely with the Electrical Engineering faculty in preparing, circulating, and interpreting the results of a course evaluation form. Two students from Eta Kappa Nu have met frequently with the faculty at their curriculum meetings to personally give the students' views on the current curriculum problems and possible solutions. It is hoped that soon, through all this work, the EE curriculum will be revised to please more students and professors.

To complement our regular meetings, guest speakers who are professors of the staff have given talks on their own special research. One very interesting talk was by Professor Nordman on "SUPERCONDUCTIVITY", which also included a tour of his thin-film laboratory.

Theta Chapter voted unanimously to postpone fall initiation until spring semester due to a delay in the computerized class rankings.

At our last meeting new officers were elected for the present semester.

By Robert Schoen

IOTA CHAPTER, University of Missouri, Columbia—Implementation of the Big Brother program was one of the major objectives of Iota Chapter during the fall of 1969. This program offered the services of Eta Kappa Nu members as "big brothers" to new EE students. Each member was assigned to a new student and was to advise and assist him in social as well as academic activities.

Following the initiation of over 30 new members in December, the new officers of Iota Chapter were elected. At the same time, Ron Hodges was selected as Outstanding Senior EE.

Iota Chapter was the only honorary to enter an intramural football team at U.M.C. and the team advanced to the semifinals before being stopped. The HKN basketball team also provided recreation for some members but due to a shortage of players it was unable to match the success of the football team.

By Denis Fessler

KAPPA CHAPTER, Cornell University—During the fall semester, the Kappa Chapter instituted a non-profit coffee hour for students and faculty of the School of Electrical Engineering. It has been well received and there are plans for expansion.

The chapter also undertook the distribution and tabulation of course evaluation forms and is looking into the possibility of running a summary listing

of technical elective courses coupled with a short synopsis of each to help undergraduates choose the courses they would be most interested in.

By Cheryl Falkenburg

ZETA CHAPTER, Case Institute of Technology—The Fall 1969 Semester was a time of reconstruction for the Zeta Chapter of Eta Kappa Nu. The officers undertook a vigorous program designed to make Zeta Chapter useful to both students and faculty.

The outstanding EE student at Case in 1969 was awarded a plaque and his name inscribed on the HKN honor plaque next to the Dean's office.

A very successful Pledge program was conducted and as a result, twelve new brothers were initiated, the largest number in some time. The initiation banquet was also a success; it brought together, informally, outstanding members of faculty and student bodies. The Dinner was followed by a slide show presented by the Dean of Engineering.

The main project of Zeta Chapter during the semester was the preparation, administration and interpretation of the student questionnaire. This questionnaire, prepared in conjunction with the Deans of the School of Engineering, sampled student opinion on Education at Case. The results will be important in helping shape the new Case curriculum.

By Edwin Pinheiro

TAU CHAPTER, University of Cincinnati—The winter quarter initiation proceedings were held on February 14 at The Colony Restaurant in Bond Hill, Cincinnati. In attendance for the banquet were 55 student members, faculty, and guests. Mr. Norb Rau highlighted the evening with a travelogue of picturesque Norway. Projects completed by the ten new initiates during their pledging period include the traditional scouring of the Swift Hall laboratories and an overhauling of our graduate catalogs and files.

Thus far this year our Eta Kappa Nu display case, presented to Swift Hall by the Class of '65, has borne an exhibition "The Making of a Patent", featuring Dr. Middendorf's electrostatic tachometer, a display from AVCO on "Thick Film Hybrid Microelectronics", and an exhibit on "Fiber Optics" from DuPont. Every month a new exhibition is to be entered.

Tau Chapter has also combined with the Student I.E.E.E. group to sponsor informal gatherings with the E.E. faculty in the Tangeman University Center.

By Wayne Naseman

BETA ALPHA CHAPTER, Drexel University—Has continued to expand both the quality and diversity of its activities by involving a large segment of the Drexel Electrical Engineering Community. Our activities are best summarized in the information sheet prepared for our last regional visitation...

Alumni Night
Tri-Initiation Banquet
Senior-Faculty Luncheon
HKN Beer Night
Tutoring of Circuits I and II
Senior Option Lectures
Selection of Faculty Advisor
Amendments to Chapter Bylaws:
Faculty Advisor
Revision of Chapter Bylaws: Quorum
Chapter Newsletters
Student-Faculty Curriculum Evaluation

As you can see we are evolving into a service organization "to promote and encourage a higher scholastic standing and desire for the greater knowledge in the studies of electrical engineering."

By Stephen Squires

BETA ZETA CHAPTER, New York University—On December 8, 1969 the Chapter initiated 16 new members—4 graduate students, 7 undergraduate Seniors and 5 Juniors. Due to low financial standing, a Beer Blast followed the initiation ceremony instead of the traditional dinner banquet.

The Chapter usually elects 2 Junior members during the first term of the year in order for them to get acquainted with the Chapter activities and the next year to become the president and vice-president. This year 5 Juniors were elected to enable a better selection.

During recent meetings we discussed plans for a gala ski weekend and other social events in order to become closely acquainted.

A tutoring program was instituted this year to help out all electrical engineering students.

A committee was organized to discuss changes in the curriculum with the Head of Electrical Engineering Department.

By Elan Lipshitz

BETA KAPPA CHAPTER, Kansas State University—Along with IEEE we again organized the picture of the 1970 graduating class. We also helped to organize and coordinate Engineering Open House which this year coincides with all-university open house. With new officers and new ideas, we look forward to a better and more productive year.

By Doug McKinley

BETA MU CHAPTER, Georgia Institute of Technology—One of the primary interests of our chapter is to provide all EE students with information on coming events, changes in the curriculum, and other items of interest. The possibility of an EE student newspaper was proposed, and our chapter accepted it as a project. The EE Word is now being published every two weeks. It contains information from the director, a faculty member profile, and news of meetings, awards, and other opportunities for students. Since many seniors are interested in graduate school, the chapter has acquired catalogs for graduate schools in engineering and business. The catalogs are available for all students in the Eta Kappa Nu study lounge.

By Bob Handell

BETA-PI CHAPTER, New York City College—This year was very successful for Beta-Pi Chapter. In spite of apathy among members, we accomplished numerous significant services to the school. Most importantly, we established a student-faculty committee which serves as a medium between students and instructors. We organized and ran an election for members of the committee, which consists of two juniors and two seniors. This committee acts as a link between the students and faculty and allows suggestions and complaints to be heard by all. The committee organized three student-faculty raps which were most successful.

A most interesting meeting introduced guest speakers from Bell Laboratories. They showed slides, movies, and a model of the picturephone. The meeting was informative and enlightening to all who attended.

We hope for continued success in the

spring semester, many more interesting meetings, and better attendance on the part of our members.

By Leonard Greenbaum

BETA PSI, University of Nebraska—Beta Psi chapter continued to work toward a more active role in the Electrical Engineering department. The Electronics Lab was opened two nights a week by HKN volunteers. Many students took advantage of the opportunity to catch up on laboratory work and get questions answered. Salesmanship was the word as Treasurer Pat Quinn hawked circuit boards to students taking their first E.E. lab. The boards, a product of pledge power, sold well.

Honors were bestowed on two Beta Psi brothers during the fall semester. At the initiation banquet, Roy Stehlik was presented the HKN Scholarship Award. The award, consisting of an engraved, gold key chain, is given each year to the junior selected from the top three men scholastically, by a committee on the basis of sociability and practicality. Beta Psi's nominee for the Outstanding Electrical Engineering Student Award, sponsored by the Los Angeles Alumni chapter, was Roger Chauza. Mr. Chauza, a fall initiate, served as pledge class president.

By Harry Silver

GAMMA-RHO CHAPTER, South Dakota State College—The Gamma Rho chapter of HKN at South Dakota State University has been busy with its normal amount of activities. For Hobo Day (Homecoming) we helped the IEEE organization on campus build and operate a float depicting a space station for the parade. Also, the addition of new members was accomplished. We have selected James Higgins as the outstanding sophomore electrical engineering student on campus. He received this recognition at the annual spring smoker (which is sponsored by the engineering college). The chapter is now turning its attention to preparing exhibits for the

Engineer's Open House which is on March 21.

By Jerome Bly

GAMMA PHI CHAPTER, Eta Kappa Nu, University of Arkansas—We have just ended the annual Engineer's Week at the University of Arkansas. An open house was held on Saturday March 14, 1970. The open house gives the public a chance to see what engineering students do. Almost all of the Eta Kappa Nu members participated in open house arrangements.

We have a spring picnic planned for about the middle of April. The spring picnic gives students and faculty a chance to get together. Also, a treasure hunt will go along with the picnic and offer the students a chance to use their ingenuity. The spring initiations should end our activities.

By Dwight Chamberlain

DELTA LAMBDA, North Carolina University—The Chapter is sponsoring a weekly coffee break for all EE students and faculty. It is scheduled at a time when all students have a class in the Engineering Building. A series of weekly lectures on the Principles of Radio and TV is planned for the spring semester. EE faculty members and graduate students will serve as instructors. The semi-annual initiation of new members held on December 14, 1969 involved three new junior members and two new seniors.

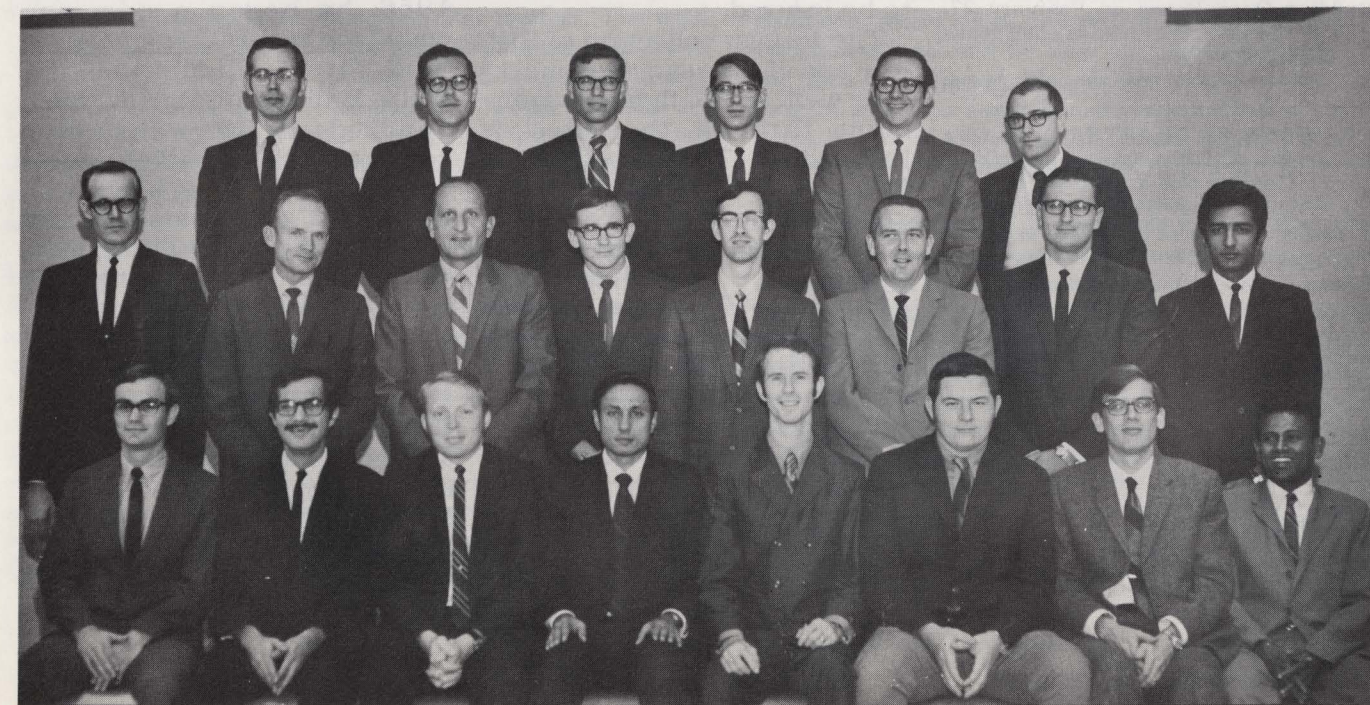
By Kenneth Pugh

DELTA SIGMA CHAPTER, University of Notre Dame—The first objective of the Delta-Sigma chapter was to increase its membership. Graduations had reduced the chapter to a small but talented core of five officers. The recruiting was successful. Nine undergraduates were initiated, almost tripling the membership.

Five members of HKN served as the student representatives on the EE De-

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Below: Pledge class at Univ. of Texas at Arlington



23 ♦ Chapters

partment's curriculum evaluation committee. The committee was formed to study the proposed changes in the EE program at Notre Dame.

Plans were finalized for the HKN organized and sponsored EE basketball league. The league, open to all undergraduate and graduate students in electrical engineering, consists of eight teams, with games played each Saturday. The season will climax with the greatest sports event since Notre Dame went to the Cotton Bowl: EE Seniors vs. EE Faculty.

The Delta-Sigma chapter also participated in sophomore tutoring, the Graduate School Seminar, the Engineering Open House, and a high school recruiting program.

By Bob Scott

EPSILON MU, University of Texas at Arlington—The first order of business last semester was the pledge program. The accepting candidates had several projects to complete before the final ceremony. Signature lists, the wearing of a hat for a week, and the building of an electric motor by each pledge was required. The hats with large "HKN" letters and a vacuum tube on top created interesting remarks but served its purpose of recognition. An outing each semester provides fun and entertainment for the actives and helps the pledges become more acquainted with other fellow electrical engineering majors.

Also Eta Kappa Nu here at the University of Texas at Arlington provides a study clinic for electrical engineering majors. It is our most important service to the school and is open each afternoon during the week. A volunteer HKN member is always present to help those having difficulty with their homework problems.

This semester the Electrical Engineering Department will be assisted by HKN and IEEE members in the Engineering Building Open House on February 27. This is the first time such an open house is being held.

By Eugene Preston

EPSILON PI CHAPTER, Princeton University—The first activity of the Epsilon Pi Chapter this academic year was the initiation of new graduate and undergraduate members. After the names of the qualified juniors and seniors in the Electrical Engineering Dept. had been obtained, letters were sent to these men inviting them to attend a special meeting introducing them to Eta Kappa Nu and to the members. Similar letters were sent to all graduate students in the department. The induction ceremony and banquet were well attended by the old members, the new members, and the faculty. Brief words of introduction and congratulation were spoken after the banquet by the Chairman of the Depart-

ment, Professor Van Valkenburg, and our Faculty Advisor, Professor Altman. The feature of our banquet was a talk by Professor John Thomas on what to expect after graduation.

Other activities this year included a trip to the Eastern Regional Visitation held in Philadelphia. Attending were James Tang, Chapter President, and Professor Altman. They met with representatives from other chapters in our region and discussed typical chapter activities and problems.

Epsilon Pi Chapter has also launched a project to compile a resume of all the undergraduate courses in the department. This will be written by our members who have taken these courses and wish to supplement the necessarily brief course descriptions in the official catalog. When completed the booklet will be available in the Engineering Quadrangle Library to aid undergraduate Electrical Engineering students with course selection. The chapter is also involved in composing a set of bylaws to govern itself in the future.

By Jeffrey Holmes

8 ♦ Real and Imaginary

by two men; a third directed the feeble stream of water issuing from a tube, while the fourth member of the team replenished the water in the tub—with a bucket!

The Great Fire of London in 1666, which demolished 90 churches and more than 13,000 houses, naturally stimulated a concern for fire engines and better fire fighting methods. It also prompted the organization of insurance underwriting companies—which issued distinctive metal fire marks to the owners of buildings that were to be insured.

The largest collection of British and American fire marks—as well as fire fighting equipment through the ages—is located in The Firefighting Museum of The Home Insurance Company, in New York City. The museum keeps alive the romance and adventure of early fire fighting in this of the colorful and daring volunteer firemen. These men, who served without pay, did so out of devotion and a sense of pride. They loved their pumpers, painting them in bright colors and gay designs, and worked the hand bars furiously

to outpump rival volunteer companies.

As an individual, the volunteer fireman was expected to stop whatever he was doing, whether at work or at play, and hasten to his fire station when the alarm sounded. If he failed to follow the strict rules, he was fined. In the minute book of Engine 13, the following entry was made on January 15, 1807: "Harris Sages' excuse is received. He says at the time of fire he was locked in someone's arms and could not hear the alarm"—but there is no comment as to whether he was fined or "pardoned."

Because of the lack of dependable water supply, it was often necessary for the hand-pumped engines to form a line, one pumping into another. At a fire in a food store at Eldridge and Rivington Streets, New York, in the 1860's 23 engines with six thousand feet of hose were connected in line to produce one stream of water.

To the beloved hand-pumper, time added the steam pumper, drawn by horses, which could throw 750 gallons of water a minute—and finally the efficient gasoline or diesel engines and pumps that we are familiar with today.

24 ♦ Evans

music. After his retirement in 1956, he began a one man endeavor instituting a hospital fund for the benefit of the White Hall Hospital. He crafted hundreds of items including sconces, candlesticks, and compotes chiefly of black walnut. With the assistance of Mrs. Evans, these items were sold and the entire proceeds donated to the hospital fund.

He was also a 60 year member of the White Hall Masonic Lodge, the Consistory and Tripoli Shrine, Milwaukee. In addition, he was a member of the Shrine Band and the Blatz Post American Legion Band of Milwaukee.



Miggs

5TH APRIL

at the last minute. We load up the cars and take a fond farewell of our little convict, whom Catherine says she would like to take back to Hopewell, New Jersey, to weed her garden, and we proceed as far as the public square. Catherine has at last had a cable from Alan, who is in Rome, and who will not after all rejoin us. She has a letter to mail to him and everyone wants Chad stamps. Liv has a cable to compose to the Prime Minister of Chad, at Fort Lamy. It is His Excellency Prime Minister Tomboul Bey who has made possible our entry into Chad by the north-east border. This route is generally forbidden, as its tracklessness and lack of any wells makes it hazardous to the traveller and fraught with the possibilities of trouble to the authorities. We had hoped to be able to fly to Fort Lamy and call upon the Prime Minister to express our thanks in person. But our many breakdowns and delays have eaten up too much time. We have less than three weeks before we must be back in Benghazi, and still more than four thousand kilometres to cover. While letters and cables are being despatched an officer hurries across the square to Captain Lecomte. A man is lying dead down the road. Camel theft has reared its ugly head again! Lecomte scowls and shrugs.

'I will deal with it when I get back,' he says. 'First I must say goodbye to my friends.'

He leads us out of town on to the track for Zouar, which he says is very difficult to find even in clear weather. And we are leaving Faya-Largeau in anything but clear weather. The wind whips the sand like spray into the air, reducing the visibility to a 'mere smear'. We race up the dunes which are almost literally marching on Largeau this morning. Down their far sides are valleys as hard and flat as tennis courts. Here, after pointing out our direction, kissing the ladies' hands, saluting gaily and wishing us well, our Captain turns and vanishes in a swirling foam of sand.

We immediately lose sight of the track which is obliterated by sweeping inundations of sand even as we watch it. With Francis in the lead we bang over hidden ridges, bog in creamy swamps. We have carburettor trouble and Liv must get out and clean it, with sand blowing like red-hot needles into his face, his eyes, his ears and lungs. He says he thinks we are all going to die of silicosis. Catherine gives him a chiffon scarf which he wraps around his face, but this sand would go through a stone wall let alone a bit of silk. We tie a sheet to the windward side of the hood and anchor it with our bodies, trying to protect the machinery if not the man. Our legs and backs are lashed and stung, and Catherine has the nerve to tell us that you have to pay for sand-

The Great Sahara Mousehunt

Catherine Collins
and
Miggs Pomeroy

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message like this at the beauty parlours of New York! The damage repaired, we struggle on. The cars rock in the wind and dip and roll on the boiling earth like lumbering elephants. Everywhere are wind-carved sandstone cliffs. There is no pretence of knowing where we are. It is plain that we are witnessing the Creation, for here the crust of the earth is still bubbling and bursting; soft boils of blue-grey matter seem to plop-plop all about us and an unholy smoke steams up into the laden air. 'Realize thyself, amoeba dear' has not yet been spoken. The moment has not yet come. Life cannot exist in this place—not here. We cross vast plains of talcum powder, the 'fesh-fesh' of the Arabs. Caliche, Hank calls it. We race across it with almost hysterical speed, fearful of its delicate crust. We stir up atomic blasts of dust that mushroom into the sky, completely blotting out each of us in turn so that the car behind cannot see what has happened to the car in front. The earth may open and swallow us alive in this dreadful place, but there is nothing to do but race to the end, whatever end it be. Catherine says that this is the only time, so far, that she has been really frightened, and Winston says that it smells of vanilla! We come through this smouldering inferno with only one bogging, during which Liv manages to push out a small window-pane at the back of our car. After this we wrap out heads in towels in order to breathe at all. Now the crust is thinner, a greenish-white meringue which breaks under our weight. There is a nightmare quality to this day that leaves us with nothing to do but laugh. By evening we figure that we are no more than twenty-five miles from Largeau, having made a loop around the town. However poorly our dashing military friends think of their post, we think of it nostalgically as a little metropolis, a gem of civilized living from whose bright lights and gay faces we have been banished.

We make camp beneath a wall of dunes. Liv and Winston and Francis go off to 'recce', saying that they will be back by the time tea is made. They want to see if they can find the track. The wind has dropped with the sun and we are all tired and very doubtful of this manoeuvre.

Two hours and one gallon of tea later the 'recce' party is still not back. There is no moon, the stars are bright, but the desert is a big place. We are not in flat country here where our camp lights might be expected to be seen from any distance. Hank is pessimistic in an optimistic way. He says I'm not to worry if they don't get back tonight, he himself doesn't think that they possibly can. He points out that they have food and water with them so there is nothing to worry about. But then it's not his husband out there! I tell him as much and we blow our respective tops at each other and then feel ashamed, like children caught sticking out their tongues, and rather bashfully make friends. Hank sets up the spotlights, one aimed at Jack's aerial, one sweeping the sky. Catherine and I stumble up the highest dune with a torch and are appalled at the extent of blackness beyond. At eight o'clock Hank fires off a Very pistol but there is no answering rocket. Then, just before nine, a flare streaks across the sky to the west. We shout with relief and Hank shoots off an answering signal. We train the spotlights westward, sweeping the horizon. But there is nothing there, no glimmer of light, no looming shape. We wonder if they are stuck or need help. And then with a rumble and blare of horn they come racing in over a dune from the opposite direction. They have been stuck, more than once, axle-deep in fesh-fesh, and had finally to jack the car to get out. They pretend to be shocked that we could have thought that they—of all skilled desert navigators—should be lost. They say that they had neither fired their flare nor seen ours. They laugh at us and tell us scornfully that we have wasted our ammunition on a shooting star. (Cont'd)

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