Should You Work for a Big Company?

An interview with General Electric's S. W. Corbin, Vice President and General Manager, Industrial Sales Division.

Q. How about attaining positions of responsibility?

A. How much responsibility do you want? If you'd like to contribute to the design of tomorrow's atomic reactors—or work on the installation of complex industrial systems—or take part in supervising the manufacture of exotic machine-tool controls—or design new hardware or software for G.E. computers—or direct a million dollars in annual sales through distributors—you can do it, in a big company like General Electric, if you show you have the ability. There's no limit to responsibility... except your own talent and desire.

Q. Can big companies offer advantages in training and career development programs?

A. Yes. We employ large numbers of people each year so we can often set up specialized training programs that are hard to duplicate elsewhere. Our Technical Marketing Program, for example, has specialized assignments both for initial training and career development that vary depending on whether you want a future in sales, application engineering or installation and service engineering. In the Manufacturing Program, assignments are given in manufacturing engineering, factory supervision, quality control, materials management, or plant engineering. Other specialized programs exist, like the Product Engineering Program for you prospective creative design engineers, and the highly selective Research Training Program.

Q. Doesn't that mean there will be more competition for the top jobs?

A. You'll always find competition for a good job, no matter where you go! But in a company like G.E. where there are 150 product operations, with broad research and sales organizations to back them up, you'll have less chance for your ambition to be stalemated. Why? Simply because there are more top jobs to compete for.

Q. How can a big company help me fight technological obscurantism?

A. Wherever you are in General Electric, you'll be helping create a rapid pace of product development to serve highly competitive markets. As a member of the G.E. team, you'll be on the leading edge of the wave of advancement—by adapting new research findings to product designs, by keeping your customers informed of new product developments that can improve or even revolutionize their operations, and by developing new machines, processes and methods to manufacture these new products. And there will be classwork too. There's too much to be done to let you get out of date!

OUR COVER
We will sail up to the moon
In a little toy balloon
And live on love and kisses
On our Pi Phi honeymoon.

Now that space ships are being sent to the moon on a regular basis we can well imagine that the time is not far distant when tourist flights will be scheduled to that romantic place. We who still marvel at the safety pin are utterly overwhelmed by the complexities of outer-space transportation. But lest we go off the deep end, let us ever be reminded that when the first tourists reach the moon they will be greeted by a souvenir shop that sells fluorescent neckties imprinted with hula girls (very appropriate for morticians and diamond cutters), mother-of-pearl coated 39V binoculars (excellent for watching a flea circus), and lavender satin cushion covers with tomobtones in relief (no Halloween party should be without them).

of ETA KAPPA NU

Electrical Engineering Honor Society

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Editor and Business Manager
Paul K. Hudson

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Our Satellite, The Moon

A closeup look at the lunar surface is necessary in order to prepare for future instrumented soft landings and finally the manned missions.

Jet Propulsion Laboratory, Pasadena, California

The Moon, our closest celestial neighbor and the object of legends and superstitions since history began, is as familiar to us as is the face of a close friend. We know the solemn beauty of the full Moon and the half comic, half frightening face of the "Man in the Moon." Poets ponder the influence of the ever-constant Moon on romance. Children speculate whether or not it is really made of green cheese. And more sober adults smile condescendingly at both of these theories. Yet very little is actually known about the Moon.

A prehistoric remnant, relatively unchanged for billions of years, the Moon may prove to be the Rosetta Stone that will unlock many of the secrets of the origin and evolution of our solar system.

In 1609 Galileo described his observations of the Moon as follows:

"The prominences there are mainly very similar to our most rugged and steepest mountains, and some of them are seen to be drawn out in long tracts of hundreds of miles. Others are in more compact groups, and there are also many detached and solitary rocks, precipitous and craggy. But what occur most frequently there are certain ridges, somewhat raised, which surround and enclose plains of different sizes and various shapes but for the most part, circular. In the middle of many of these there is a mountain in sharp relief and some are filled with a dark substance similar to that of the large spots that are seen with the naked eye; these are the largest ones, and there are a very great number of smaller ones, almost all of them circular."

Galileo first gazed at the Moon through a telescope more than 350 years ago. Since that time, however, we have seen little more of the detail of the Moon's surface than did Galileo. Our modern telescopes are better, but we still stand the same distance from the Moon and on

the same platform—the Earth. We still must peer through the same mantle of atmosphere that hindered Galileo’s viewing. That blanket of life-giving air that protects Earth life and causes the stars to twinkle so delightfully unfortunately makes the details of the Moon twinkle also.

Although the lunar surface conditions still elude us, we have learned a few facts about the Moon. We conclude that the Moon has no surface water and no appreciable atmosphere. For all practical purposes, its distance from the Sun is the same as the Earth’s, and so it receives the same amount of heat from the Sun. But, due to the lack of atmosphere, the temperature on the Moon’s surface ranges from 201°F at noon, hotter than boiling water on Earth, to –243°F at midnight—more than twice as cold as any place on Earth. Such extremes of temperature, coupled with the lack of atmosphere on the Moon, would presumably preclude the existence of any form of life as we know it. Still the possibility of the existence of so-called sub-life forms must be considered. The action of atoms and molecules at the surface, or just under the surface of the Moon, under eon-long bombardment by undiluted solar radiation and by cosmic rays, cannot be predicted. The formation of complex macro-molecules may be possible.

Additionally, the Moon has a diameter of about 2163 miles—about one-quarter that of Earth. Because it is smaller than Earth, its gravity is much less. Standing on the surface of the Moon, one would weigh only one-sixth as much as he weighs on Earth. The density of the Moon is 3.3 times that of water, while that of Earth is 5.5. Scientists agree that the Moon’s mass is about 1/4 percent of the Earth’s mass. The lunar world is in a slightly elliptical orbit at an average distance of approximately 238,000 miles from Earth. The Moon requires 27½ days to make a complete orbit of Earth and, because its rotational period is the same, it always presents the same face toward Earth.

The Moon generates no light of its own and shines solely by reflected sunlight or Earthlight. Only 59% of its surface is visible from Earth. The Moon has no obvious effect on the climate of the Earth, but it is the dominant factor in the production of tides. There is also some slight but distinct relationship between the changes of distance of the Moon from the Earth and variations in terrestrial magnetism.

Recent studies have made it appear probable that the great craters on the Moon are impact craters rather than volcanic craters (Figs. 1 and 2). It also seems that at least some of the maria (the great plains) are the direct result of impact (Fig. 3). It is not clear if the impacts acted primarily as a trigger mechanism releasing molten material (if any) from the Moon’s interior, or if the melting material resulted primarily from the kinetic energy of the impacts.

Although the great craters appear to be meteoric in origin, this does not imply that no volcanic activity can exist on the Moon. On the contrary, there are rows of craterlets, near Copernicus, which may be due to volcanic activity. One of the most interesting observations in the past few years was made in a portion of the crater Alphonsus. A temporary haziness was found which lasted long enough to obtain a spectrogram confirming the existence of carbonaceous molecules and some yet unidentified species. So gases do exist, at least for a short time, on the surface of the Moon. This “atmosphere” is very tenuous at best and must consist primarily of a few stray molecules of heavy inert gases. Perhaps a few light gases are in existence for a short time and immediately after a volcanic emission. Additionally, in recent months, unidentified reddish areas have been sighted in other parts of the lunar surface.

One school of thought suggests that the maria, or plains, as well as the centers of many of the old craters, are filled with dust. The thickness of the layer of dust is estimated by the total amount of rock which could have been worn from all of the old crater walls in the highlands. On this basis, a number of 1 kilometer is reached for the maximum dust depth—that is, a little over 1 mile.

Experiments have indicated that dust, in a vacuum such as on the surface of the Moon, would tend to become hard packed. So we can imagine that any deep dust layer on the Moon would resemble pumice more than the dust with which we are familiar. Accordingly, there would seem to be little danger of our spacecraft being buried in a half-mile of loose dust. However, there are also the theories of suspended dust, sintered dust, and no dust at all. Thus, the most important task we must accomplish in the early stages of lunar exploration will be to determine the exact nature of the Moon’s surface. This will be the starting place, and eventually all the questions will be answered. The exact nature of the Moon’s surface is extremely important to the basic design of both unmanned and manned lunar spacecraft; unfortunately, it is not possible to resolve these questions by looking through our telescopes.

In the photograph (Fig. 4) the Mare Imbrium—the right eye of the man in the Moon—is seen (top left). This is one of the level plains or maria. Standing out on the plain just below the outer rim of mountains is Mt. Piton. In the photograph (taken by Lick Observatory, University of California, Mt. Hamilton, California), Mt. Piton appears as a small, jagged hound’s tooth. It is possible to measure heights on the Moon with surprising accuracy by measuring shadow lengths. A better understanding of the actual configuration of Mt. Piton may be obtained by considering ourselves as Moon explorers, standing on the surface of the Moon, a few miles from its base. From here it would appear as a high but gentle sloping mountain rising to about 7000 feet and stretching out more than 70,000 feet (about 13 miles). The top is so nearly level that it would be difficult to determine the highest point. Certainly, from this point of view, it looks very different from the rugged mountain it appears to be in the photograph.
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In pictures of the Moon taken with the 200-inch telescope at Palomar at high magnification (Fig. 1), the smallest detail that can be seen almost a mile across. Details smaller than that are simply unresolved and must await the actual landing of our scientific instruments on the Moon or close distance photographing of the Moon by cameras operating outside the distortion of the Earth’s atmosphere.

Figure 4. Eastern part of the Moon

*Displayed at the right

Texas Instruments
INCORPORATED
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An Equal Opportunity Employer
Electrical Industries of America VI

Western Electric began operations in a Cleveland loft in 1869 as the firm of Gray and Barton. Its purpose: to build quality telegraph instruments and other electrical products.

Its founders were Elisha Gray, a physics professor and inventor; Enos Barton, a former telegrapher; and General Anson Stager, who had been chief of military telegraph for the Union Forces in the Civil War.

The firm moved from Cleveland to Chicago, and in 1872 changed its name to the Western Electric Manufacturing Company.

After the telephone was invented in 1876, Western Electric became one of a half-dozen firms competing in the production of telephone equipment. But in 1882, the fast-growing Bell Company acquired a controlling interest in the Western Electric Manufacturing Company and shortened the name to its present form.

Western Electric had become the largest electrical manufacturer and distributor in the United States and eventually there were W.E. plants in several European countries, Belgium, France, Italy, England and Germany.

In the meantime, the Company had taken on other tasks for the Bell System: it had become the chief installer of central office equipment and the central buyer of supplies.

As the number of telephones in the nation increased—their number more than a million by the early 1900's—Western Electric expanded its manufacturing and purchasing programs and opened its first Distributing House. This was in 1901, in Philadelphia.

After World War I the growing needs of the telephone industry required Western Electric to concentrate more and more of its resources on its job as the Bell System's basic source of supply. By 1925, Western Electric had sold its power equipment and home appliance business and its foreign telephone and electrical jobbing interests, gaining a singleness of purpose in its Bell System tasks.

The period since World War II has been one of further growth and dynamic change for Western Electric, which now ranks among the top companies in the nation in terms of number of employees and dollar volume of sales.

Now, as we enter the Space Age, there are many new challenges in the science of communications. Western Electric will respond to them.

Technology
Rapid and startling changes in the science of communication have taken place in recent years. In telephony, for example, some two-thirds of the products Western Electric makes for the telephone companies were introduced or substantially modified after 1950.

To produce them, Western Electric has constantly improved its processes, methods and equipment to take full advantage of the developments which have flowed from Bell Laboratories. New processes and techniques originating with W.E. engineers and technicans have been adopted by patent licensees around the world.

Advances in communications science in recent years, for example, have included such diverse achievements by Bell Labs and Western Electric as the artificial growing of quartz crystals; development of a "tropospheric scatter" system of radio relay; and development of a Data-Phone system in which "machines talk to machines," transmitting and receiving business data over regular telephone circuits, an electronic telephone switching system and a completely automatic production line for manufacturing deposited carbon resistors.

The coming years will undoubtedly see even greater technological advances by Western Electric. To assure such work in the future, an engineering research center has already been established near Princeton, New Jersey. Here, engineers and scientists are doing basic research in the application of machines, materials and computers to manufacturing processes.

But, as in the past, the successful penetration into the future will come from the motive force, the unified momentum of all Western Electric and Bell System people.

The Western Electric Job
W.E.'s basic job is much the same as it was in 1882—to provide the Bell System with a reliable source of high quality telephone equipment. There are four principal ways in which Western Electric goes about this job:

Manufacturing: Western Electric produces to uniform standards of design and quality a great variety of equipment, wire and cable for the Bell System network. The task calls forth the cumulative effort of major plants in 13 cities.

Distributing: Western Electric maintains 35 distributing houses for warehousing materials and supplies needed by the telephone companies and for the repair of Bell System equipment.

Installing: W.E. installers handle the job of installing central office equipment for the telephone companies, completing in the field the assembly of complex switching and transmission units produced in W.E. factories.

Purchasing: Western Electric buys from thousands of large and small companies the raw materials needed for its own manufacturing processes, and those finished products which are manufactured by others.

Manufacturing
Each year, Western Electric produces more than 50,000 different kinds of telephone products.
The products of Western Electric vary greatly. In size: from giant reels of cable and tall central office switching equipment to tiny thermistors which are almost invisible. In shape: items round as a finger-wheel dial or square as a telephone booth. In complexity: from relatively simple mechanical switches to equipment as intricate as that employed in the recent developed “TASI” (Time Assigned Speech Interpolation) system which has doubled the capacity of undersea cables by actually permitting utilization of the normal pauses that occur during telephone conversations.

But each of W.E.’s products bears a common mark. Each has been subjected to rigid inspection and tests in conformance with unyielding Bell System standards. And, as a result, each is readily distinguishable by its built-in quality, a quality compounded from fine materials, engineering skill and the efforts of able personnel.

Distributing

America’s great chains of retail stores are successful largely because they compete vigorously in offering quality merchandise at the lowest prices possible while pursuing a “customer-is-always-right” policy of service.

Western Electric also operates a nation-wide chain of “stores” called distributing houses. Each of these stores has only one customer—the local Bell telephone company—and its job is to see that this one customer is furnished top-notch service and quality products at attractive prices.

The 35 distributing houses serve the Bell telephone companies in two chief ways: they furnish supplies and equipment and they repair service-worn telephone items. In addition, the distributing houses work closely with W.E.’s marketing organization which makes certain that (1) Western Electric is offering the products, services and supplies that the Bell companies want and need, and (2) that the telephone companies are thoroughly informed about the new products and services offered by Western Electric. Through the distributing houses pass the orders which the Bell telephone companies place on Western Electric. Some orders are filled from local distributing house stocks. Others are forwarded to the company’s factory merchandise organization for scheduling and manufacturing, and still others are routed to the supplies service organization for shipment from suppliers on contracts arranged by the purchasing division.

(Continued on Page 16)

John Lauritzen wanted further knowledge

He’s finding it at Western Electric

When the University of Nevada awarded John Lauritzen his B.S.E.E. in 1961, it was only the first big step in the learning program he envisions for himself. This led him to Western Electric. For WE agrees that ever-increasing knowledge is essential to the development of its engineers—and it helps the local Bell telephone company—and its job is to see that this one customer is furnished top-notch service and quality products at attractive prices.

The 35 distributing houses serve the Bell telephone companies in two chief ways: they furnish supplies and equipment and they repair service-worn telephone items. In addition, the distributing houses work closely with W.E.’s marketing organization which makes certain that (1) Western Electric is offering the products, services and supplies that the Bell companies want and need, and (2) that the telephone companies are thoroughly informed about the new products and services offered by Western Electric. Through the distributing houses pass the orders which the Bell telephone companies place on Western Electric. Some orders are filled from local distributing house stocks. Others are forwarded to the company’s factory merchandise organization for scheduling and manufacturing, and still others are routed to the supplies service organization for shipment from suppliers on contracts arranged by the purchasing division.

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MEET THE NEW HKN

R. J. W. KOOPMAN
President

Professor Koopman was born in St. Louis, Missouri, in 1906. While at an early age his parents moved to a farm in the vicinity of Wright City, Missouri, where he attended a rural school, Wright City High School, and Central Wesleyan Academy at Warrenton, Missouri. His freshman college year was spent at the Missouri School of Mines and Metallurgy at Rolla, after which he transferred to the University of Missouri at Columbia, receiving the B.S. degree in Engineering with major in Electrical Engineering in 1928.

From 1928 to 1931 he was associated with the General Electric Company in Schenectady, New York, doing work on vacuum switches, mercury rectifiers, testing rotating machinery and indus-

HOWARD H. SHEPPARD
Vice President

Upon my graduation from the University of Pennsylvania in 1922, with a B.S. in EE, the great depression was well underway, and the only electrical engineering jobs open to most of us were at Philco Radio at $15.00 a week.

Most of the EE's graduating from Penn during the depression took any jobs they could scrape up, and in many cases these were quite remote from electrical engineering. One started as a teller in a large industrial bank and is now the bank president. Another sold life insurance and today is the owner of one of the most successful agencies in the East. A third wound up as a nationally known radio announcer and personality during the heydays of radio.

THOMAS L. ROTHWELL
National Director

A 1928 vintage son of a Michigan school superintendent, Thomas L. Rothwell, Jr., enjoyed an old-fashioned straight-laced upbringing. Believing in the early development of independence and self-reliance, young Tom's parents encouraged his efforts in this vein.

Tom worked his way through High School as a stock clerk in a local supermarket. During this period he somehow found time to pursue a hobby he had loved since boyhood—flying. Model airplanes sufficed until age 16, the minimum for solo flight. At age 16 he "so- lved" in the real thing. While enjoying this model airplane and flying hobby, Tom had discovered a new interest and was studying and developing a hobby that would ultimately affect his professional future.

(Continued on Page 21)

OCTAVIO M. SALATI
National Director

Octavio M. Salati was born on December 12, 1914, in Philadelphia, Pennsylvania. His family soon settled in the suburban Philadelphia area of New Jersey where he completed his elementary education.

He attended Haddonfield Memorial High School prior to entering The Moore School of Electrical Engineering of the University of Pennsylvania. He joined the Institute of Radio Engineers, the American Institute of Electrical Engineers and the Franklin Institute in 1934. He was elected to Lambda Chapter of Eta Kappa Nu in 1935. He received the B.S. degree in electrical engineering in 1936. Following brief employments with Philco and the Radio Corporation of America, he joined the Bendix Research Lab in New Jersey. In 1946 he joined the faculty of the University of Minnesota.

(Continued on Page 22)

WILLIAM P. SMITH
National Director

William P. Smith was born in Superior, Wisconsin on January 9, 1915. He received the B.S.E.E. degree with distinction in 1936 and the M.S. in E.E. degree in 1937 from the University of Minnesota.

From 1936 to 1937 he was a teaching fellow in the Electrical Engineering Department at the University of Minnesota. He was initiated into Omicron Chapter of Eta Kappa Nu in 1934.

After leaving Minnesota he was associated with the Commonwealth Edison Company of Chicago. In 1941 he was called to active duty in the Naval Reserve and served throughout World War II at the Inspectors of Naval Materiel Office in Schenectady, New York. He presently holds the rank of Captain USNR.

(Continued on Page 18)

LAWRENCE F. STAUDER
National Director

Lawrence F. Stauder has been a member of the faculty of the University of Notre Dame since 1957. The Delta Sigma Chapter of Eta Kappa Nu was established at Notre Dame in April, 1962, during Professor Stauder's tenure as Acting Head of the Department. He is vitally concerned with the welfare of his students who have, in turn, selected him as Branch Counselor of AIEE (now IEEE) continuous-ly since 1946. He has served AIEE as Section Chairman, District Chairman of Student Activities, as well as a member of several national technical committees.

A native of Illinois, Professor Stauder received his B.S.E.E., magna cum laude, from the University of Notre Dame in 1929. He accepted employment with General
KOOPMAN (from page 12)

trial control, revising test manuals and standards, and preparing test codes for synchronous machinery. During this period he also attended Union College in Schenectady.

In 1931 he became an Instructor in Electrical Engineering at Yale University in New Haven, Connecticut, where he also did graduate work, receiving the M.S. degree in Electrical Engineering in 1933. He entered the Graduate School of the University of Missouri in 1934 and was appointed Gregory Scholar in Electrical Engineering for the academic year of 1934–35.

From 1935 to 1937 he was Instructor in Electrical Engineering, in charge of Communication Laboratory, Michigan College of Mining and Technology, Houghton, Michigan. He was named Assistant Professor of Electrical Engineering at the University of Kansas, Lawrence, in 1937. He was promoted to Associate Professor in charge of A.C. machinery, power transmission courses and the power laboratory in 1940. While at the University of Kansas he continued graduate work at the University of Missouri during several summers and received the Ph.D. with major in Electrical Engineering in 1942.

In 1943 to 1946 he was Head, Electromechanical Section, Court Wright Research Laboratory (later Cornell Aeronautical Laboratory), Buffalo, New York. He was responsible for certain phases of a project to develop a system of telemetering from air to ground, various aerodynamic quantities and was also responsible for directing the development of a complete system of radio telemetering aerodynamic quantities from rocket engines.

In 1946 Dr. Koopman became Associate Professor of Electrical Engineering at Washington University, St. Louis, in charge of a graduate course in servomechanisms. In 1949 he was named Professor and Head of the Department of Electrical Engineering, which position he held until the reorganization of the Engineering School in 1961 when he became Chairman of the Electronics and Electrical Science Area—the position he now holds. During this period a significant graduate program at the doctoral level was developed.

In addition to his university duties, he has maintained a close connection with the developments in industry through serving on consultant committees and development projects at the University. Among such assignments are, one summer with the General Electric Company on the solution of power system problems by network analyzer; seven summers with Lockhead Aircraft Company as Research Specialist, Research and Development Scientist, and University Faculty Associate; one summer with the General Motors Corporation on the solution of power supply and distribution problems for a proposed proton accelerator. At Washington University he was Project Engineer on a guided missile project, Project Director on a servomechanism improvement and on a Naval Ordinance Fire Control project; General Supervisor of a Signal Corps Diversity Reception Project and a Bureau of Standards Ionospheric Propagation Project. He has been a consultant to a large number of companies on electrical system protection and on causes of electrical failures. He has written a number of papers and discussions on electrical power, instrumentation, control and related subjects. His paper "Induction Motors on Unbalanced Voltages" with H. R. Reed won the AIEEE National Prize for Initial Paper. His paper "Operating Characteristics of Two-Phase Servomotors" has been widely quoted in papers and texts on servomechanisms.

Dr. Koopman has served the Academic Community, Professional and Scientific Societies, Civic and Religious organizations in many capacities. At the University of Kansas he was a Member, Secretary, and Chairman of the Tau Beta Pi Advisory Board, Member of Advisory Board and President of the National Executive Council of Kappa Eta Kappa, Chief Freshman Advisor, Chairman of the Administrative Committee, and Member of the Summerfield Scholarship Committee. At Washington University he has served on numerous Committees, was President of the Men's Faculty Club in 1933, President of Washington University Society Advisory Board in 1958. In 1951 he was Chairman of the Missouri-Kansas Section of the American Association for Engineering Education. He was AIEEE Branch Counsellor at the University of Kansas for several years, a Member of the American Assembly, a Member of Section Committees in Kansas City, Buffalo, and St. Louis, and a Director of AIEE National or District Technical Sessions or National Committee Meetings in St. Louis, Seattle, Santa Monica, Buffalo and Tulsa. He is a Member of the AIEEE National Committees on Telemetering, Aerophysics, Instrumentation and the Instrumentation Division. He was a Member of the Education Committee of the St. Louis Section for several years and Past-Chairman of the Aero Space Committee. He was Vice-Chairman of the Kansas City Section, Treasurer, Secretary, Vice-Chairman and Chairman of the St. Louis Section. In 1954 he was elected a Member of AIEEE with the following citation:

THE SCIENTIST AND THE ENGINEER* by DR. LEE A. DU BRIDGE President, California Institute of Technology

It is indeed a high honor to have been elected by your organization to the status of Eminent Member ofEta Kappa Nu. One has only to look through the list of individuals who have been given this honor in former years to realize what a privilege it is to join such a highly select company of great leaders in the field of science, engineering and education.

I am more than a little humble about accepting this honor, but at the same time, I suppose, all the more pleased because, as you know, I am not exactly an electrical engineer. At the same time I must confess that during the last twenty-five years I have not been completely out of contact with the electrical engineering field. In the fall of 1940, through what might be called an accident of war, I was thrown inadvertently and somewhat unwillingly into the management of a large scientific development and in what today would clearly be considered an area of electrical engineering—namely, in microwave work.

In 1940, however, the word radar had not even been invented and microwave waves were still pretty much of a laboratory curiosity. Because there was, therefore, no real engineering know-how in the microwave field and since the problems of generation and transmission of microwaves posed some pretty basic problems in physics, and because the physicists who were doing very much of the very useful work in this field in the past twenty-five years; namely, the closer tie between engineering and science. It is not my intention to use this occasion to present a

been forced to learn something about high-frequency oscillators. Under the spur of military necessity, this group of physicists did solve the physical problems which immediately faced them and then promptly turned themselves into a group of engineers to bring their ideas into workable and reliable military realities. Thus, without quite knowing it, or even intending it that way, the war-time radar groups really established a new field of electrical engineering—the field of microwave technology.

Now I mention this incident not to rationalize my own election to eminent membership in your society but only to cite an example of what has been a major trend in all fields of engineering and in many fields of science during the past twenty-five years; namely, the closer tie between engineering and science. It is not my intention to use this occasion to present a

field of electrical engineering—

(Continued on Page 21)

B R I D G E

SPRING 1965

Text of remarks given by Dr. Leo A. Du Bridge on the occasion of his induction as an Eminent Member of Eta Kappa Nu at a luncheon held at the Stork Club, New York, on August 25, 1964.

(Continued on Page 22)
WESTERN ELECTRIC (from page 10)

Installing

When you pick up a telephone and call someone, just dial the number and the central office will deliver the call to the right person. Telephone service is a luxury of modern life, and the equipment that makes it possible is a marvel of engineering.

Purchasing and Traffic

The Western Electric Company is a major supplier of telephone equipment to the Bell System. It is also one of the largest manufacturers of telephone equipment in the world. The company has an annual sales volume of over $1 billion and employs more than 40,000 people at its factories in New York, New Jersey, and Pennsylvania.

Traffic engineering is the study of how to efficiently match the needs of phone users with the available capacity of the telephone network. It involves predicting future demand, designing new systems, and optimizing existing ones.

Cooperation

The cooperation of various companies and government agencies is essential for the successful implementation of new telephone systems. Western Electric works closely with the Federal Communications Commission (FCC) and other regulatory bodies to ensure that new technologies meet safety and privacy requirements.

Conclusion

In conclusion, the telephone is a vital tool that has revolutionized communication. The technology behind it is continuously evolving, driven by advances in engineering, software, and materials. As we look to the future, it is clear that the telephone will continue to play a central role in our lives, connecting people and communities across the globe.
The outward characteristics of Western Electric's job are apparent, if you stop to think about them, every time you make a telephone call. The instrument itself, the vast switching apparatus behind it, the almost endless miles of wire and cable, have come from Western Electric. Three generations of Western Electric people have devoted themselves to the task of helping to expand and improve this great network. Their craftsmanship, their many years of experience, their pride in quality and durability, are built solidly into every piece of equipment and apparatus that bears the Company name.

One reason why Bell System service is good today, reasonable in cost, and will grow better and more useful, is that Western Electric people and the things they make are blended into the time-tested Bell System formula that combines research, supply, and operation.

SMITH (from page 13)

From 1946 until 1948 he was Dean of Pre-Engineering at Sampson College, Associated Colleges of Upper New York. He was at the University of Texas from 1948 until 1950 and received the Ph.D. from the University of Texas in 1950. He has been at the University of Kansas since 1950 and Chairman of the Electrical Engineering Department since 1955.

He has been active on research projects for the Office of Naval Research, the Signal Corps, and the Army Engineers. He also has served as consultant for a number of industrial organizations. He has presented papers to the AIEE and ASEE. In 1962 he served as consultant on Engineering Education in Bogota and Cali, Colombia.

Dr. Smith is a member of IEEE, ASEE, AAUP, Tau Beta Pi, Sigma Tau, and Sigma Xi.

He was instrumental in founding Gamma Iota Chapter of Kappa Nu at the University of Kansas in 1962 and has served as chapter adviser since that time.

STAUER (from page 13)

Electric Co., Lynn, Massachusetts, where he qualified for a cooperative program with a graduate degree from the Massachusetts Institute of Technology. He was employed by Allis-Chalmers Manufacturing Co., Milwaukee, 1934-1937, and has had summer employment and/or consultancies with Detroit Edison Co., Bendix Products Co. (South Bend) and General Dynamics (San Diego). His patents and publications have been principally in the field of electro-magnetic devices and systems. He is currently a Resident Research Associate with the Controls Group of the Particle Accelerator Division of Argonne National Laboratory.

Professor Stauder is a licensed Professional Engineer (Indiana), a member of Tau Beta Pi, the American Society for Engineering Education and a Senior Member of the Institute of Electrical and Electronics Engineers. He is married and has one son, a sophomore in Electrical Engineering at the University of Notre Dame.

REAL & IMAGINARY (from page 2)

north up its tributaries to the Min River, two hundred and fifty miles into the little-known wilds of Tibet.

He had reached the upper valleys of the rocky Min in June, when the heat was terrific by day, the chill at night cutting to the bone, the wind an endless punishment. He had struggled up the shaly trail, his chair-bearer going ahead while he himself walked—and that was when the wave of fragrance met him and he first saw the lilies.

(Continued on Page 20)
Du BRIDGE (from page 15)

that new scientific discoveries are much more rapidly transformed into practical and useful things for us and our way of life than was ever con-
idered possible fifty years ago.

I would, however, like to make a few remarks on one aspect of this subject, which I trust may be of some interest to the student members of your organization. My remarks are based on this simple thesis that while engineering and science have come closer together in recent years it should not be as-
sumed that science and engineering are identical subjects. It is true that the electrical engineer-
ing student must learn much more physics than used to be thought necessary. He may not know only about the laws of electricity but must know about quantum me-
chanics, the theory of solids, sta-
tistical mechanics, the nature of atoms, electrons and radiation. He must also study many more advanced subjects in math-
ematics than used to be required. This is in addition to all of the usual material in what is called classical physics—the basics I learned in my more traditional engineering disciplines.

Understandably, therefore, an electrical engineering student to-

day may get the impression that there is very little difference be-
 tween his undergraduate curricu-

m and that of his fellow students who are majoring in physics—

"Why don't I just call myself a physicist and be done with it," he may say. His temptation may be increased if he has the opportunity to work with some engineers who are work-

ing in industry and finds, indeed, that they do not seem to have that same in-

mate and possibly their graduate degrees in physics rather than in engineering. He will see many ex-

amples of great mathematicians with-

have become engineers and, if he

looks farther, he may even see ex-

amples of graduate engineers who have been physicists. He may well ask himself "what's the difference these days between the scientist and the engineer?"

I think the difference can be summed up in a brief but almost significant statement. The differ-

ence is not as much in the subject of study as in the point of view of the practicing engineer as compared to the prac-

ticing physicist. A professional physicist studies and pursues his subject with the primary objective of extending the bounds of our knowledge about the physical uni-

verse. A professional engineer studies and pursues his subject for the purpose of putting our knowl-
e
dge of the universe to practical use. A physicist pursues the study of solid-state physics in order to learn more about the nature of solids and their atomic, molecular, and collective electronic structures. A physicist

His men could figure a way to make a litter on which to carry him on an exhausting three-

day journey to the nearest mission hospital. By the end of the hospital days fuse and window glass is in order that he may better under-

stand more about how the ma-

chines is built and what holds it to-

gether. An engineer pursues simi-

lar studies because radioactivity, nuclear fusion and nuclear fusion have important practical applica-

tions and important future poten-

tials.

Now this difference in point of view between the scientist and the engineer is not a trivial matter, and if any professional or student with the point of view which one has which governs one's entire career. The process of conversion from a scientist to an engineer, or vice versa, while often achieved, may not be an easy one; and if it is done too late in life it may be difficult indeed.

My advice to the student, there-

fore, is very simple—as soon as it is possible to do so, with a highly deve-

oped mind as to whether you are inter-

ested in the pursuit of knowledge for its own sake, or in the pursuit of knowledge for its usefulness, then you have decided whether to be a scientist or an engineer and you should begin at once to plan your education career accordingly. The sooner you can engross your-

self in the goals toward which your career is to be directed, the more successful is your career likely to be.

REAL & IMAGINARY (from page 16)

It was an utterly impossible place for illies, or for flowers of any kind; yet there were thousands of them, tens of thousands growing in narrow meadows and on the slopes. They stood on steely stalks two to four feet high. Each bore clusters of large, fragrant, trumpet flowers which were white inside, the throat washed with more and more flushed with wine-pink. Their perfume filled that whole harsh, hot area and half intoxicated him.

Before his men could figure a way to make a litter on which to carry him on an exhausting three-

day journey to the nearest mission hospital, the patient, who had been ill for years, became and stopped over with them their one hundred and sixty hoofs.

Eventually, after much anguish and difficulty in Chinese hospitals, Ernst Wilson reached Boston for another long siege of treatment. Soon afterward, the cates were returned to the States. It seemed bad to condition, nearly seven thousand of them. They were planted; and next spring when Wilson could hobble about, the illies came up and nearly all of them bloomed. Those in the immediate neighborhood, I believe, to be descended from those original seven thousand regal illy

bulbs collected in 1910. They are easily propagated by division, and bloom profusely in early sum-

mer. Of all the flowery legacies left by Ernest Wilson, this lily of the wilderness is surely his finest.

by VIRGINIA EIFFERT

"for contributions to the theory and practice of telecommunications and tele-

metering as well as his diversity of in-
terests in the several fields of electrical engineering, through which he has be-

come a well-rounded and inspiring teacher and educational administrator.

He has been Director, Treasurer, Vice-President and President of the Engineers' Club of St. Louis. Dr. Koopman was a Member of the Brentwood PTA Council for several years, President of Fratzer School PTA and is a delegate to the November White House Con-

ference. He is serving his second term as director of the Brentwood Public School System. He is a Past Master of the Masonic Lodge in Wright City, Missouri, is a Board Member of the Central Missouri Campus Fellowship at Washin-
ton University and was a Delegate from the Brentwood Congregational-

Church to an International Lay-

man's Seminar in Chicago in 1956.

He has been a Member of Tau Bet Pi since 1927, Sigma Xi since 1935, Eta Kappa Nu since 1936 and Who's Who in America since 1958, Who's Who in Engineer-

ing since 1941, American Men of Science since 1941 and Who's Who in American since 1956.

SHEPPARD (from page 12)

Also of note is the man who be-

came a prominent advertising ex-

pert, and another a sales pro-

fessional whose accomplishments include being President of the Engineering

(Continued on next page)
Alumni Society in 1954 and currently Chairman of the General Alumni Society Editorial Board.

Other organizations to which I belong are the Association of Iron and Steel Engineers, The Franklin Institute and the Newcomen Society in North America, also, the Engineers' Club of Philadelphia; the Union League of Philadelphia; Philadelphia Cricket Club; the Wissahickon Skating Club; and Phi Kappa Psi fraternity.

These various activities and associations have been a source of gratification, but more especially they have given me the opportunity of knowing and working with a host of wonderful people throughout the United States and Canada.

However, there is no group with whom I have had any greater privilege and enjoyment of being associated with than those active in Eta Kappa Nu.

Rothwell (from page 12)
ture—electronics and amateur radio.

After completing High School in 1946 he joined the U.S. Army Air Corps for a three-year hitch. Two and one-half of the three years were spent in India, where he progressively rapidly to become Maintenance Chief for a communications outfit. Earning his amateur radio license just prior to leaving for the Orient in early 1947 proved to be a real advantage. It gave an opportunity for technical development, and occupied quantities of spare time. By the time he departed in 1949 he had become internationally renowned for his excellent communicating.

Returning home in the Fall of 1949 he met and married his vivacious wife Vivian. February 1950 found him underway at the University of Southern California in pursuit of his E.E. degree. In order to supplement their income he joined the Air Force Reserve in late February 1950. On 19 August 1959 President Truman sent him his greetings, and invited him to report in ten days for a 21-month tour of duty to assist in the Korean War.

This behind him, Tom returned to civilian life, and resumed college during the summer 1952. In Fall 1953 he was elected to Eta Kappa Nu. He was elected Treasurer, then President of Upsilon Chapter. As President, he attended the Eta Kappa Nu Golden Anniversary Convention at Uiriana in the Fall of 1954. During college he also served as Vice President of the Tau Beta Pi Chapter, and Vice Chairman of the Joint AIRE/IEEE Joint.

Joining Hughes Aircraft Company upon graduation in January 1956 Rothwell taught, and later supervised the training of graduate engineers on classified advanced electronics systems. During this five-year time period he attended USC evenings and earned himself an MSBE, in January 1959.

From early 1960 until mid-1961 he managed the company's retrofit engineering operation, with the responsibility for systems modernization through modification.

Recognizing the future of the field of digital computers as one of the most promising, Rothwell involved himself in the area related to their application for automatic checkouts, test and monitoring. Currently Manager of Autotest Applications, he has the responsibility for charting the company's future course in this exciting new field. During this time he has made numerous technical contributions in the development of techniques and equipment in this area.

Active in Eta Kappa Nu since his initiation as an undergraduate, he was elected as Treasurer of the Los Angeles Alumni Chapter in 1963, and subsequently served as Secretary, Vice President, and President.

Receiving this service to our Association, the Board of Directors, in establishing the new Western Region in 1962, appointed Tom Rothwell as one of its Directors. This appointment was later confirmed by the Assembled Convention of 1962. He served his appointed term with vigor, ability and enthusiasm, and has recently been elected to continue in his efforts for Eta Kappa Nu.

On the personal side—Tom and Vivian, married now for nearly 15 years, have a daughter 8½ and a son 4½ years old. The family favorites include flying trips, and campouts in the desert or mountains.

Salati (from page 13)
America, he received the M.S. degree in electrical engineering from the University of Pennsylvania in 1939.

An early interest in music and experience with the repair of pianos and reed organs was responsible for his Masters' Thesis: "An Experimental Study of the Vibrations in Harmonic Content of Violin Tones." This study led to his subsequent employment at C. G. Conn Ltd., Elkhart, Indiana. Here he was engaged in the development of disc and wire recording equipment and studies of piano tuning using the Com Chromatic Stroboscope.

In 1941, he transferred to the Hatzlone Electronics Corporation where he became senior engineer in charge of Antennas and Magnetostriuctive Delay Line Development. It was here that he conceived his first invention, the BNC connector.

In 1948, he returned to the Moore School to retread his engineering training with part-time research and academic work. Research on a U.S. Army Fire Control System was responsible for four additional patents. This work is research and development like the above that interested Fortune Magazine to publish an article recently on "The Egghead Millionaires." My point is that...
INVESTMENTS

ing a security and forgetting about it can lead to disaster. Investments always should be watched carefully.

There are various avenues available for channeling investment funds.

Mutual Funds — These are investments in which the business is to invest shareholders money in securities and manage these investments for a fee. Its funds for investment are obtained through the sale of shares to investors. The money received from the investors is combined and invested as though it were a single account. Each shareholder participates in net income and capital appreciation in proportion to the number of shares owned.

The mutual fund receives its income from 1) dividends and interest payments made on the securities in which its money is invested; and 2) from net gains made whenever it sells its portfolio securities at an overall profit. (On occasion the fund will sell to offset gains against losses.) After deducting expenses, including management costs and custodian fees, the Fund generally pays out and balances in dividends (at least every three months) and capital gains distributions (probably at the end of the year if any) to the shareholders. We will discuss mutual funds at greater detail in future articles.

Individuals with funds available for investment should do a self-examination with regard to the following points.

How dependent am I upon investment income?

How much risk am I able and willing to take?

Am I patient enough to give investments time to mature?

With reference to the above, there are three basic ingredients that can be blended toward completing a most deflatable and profitable investment portfolio.

Common Stocks — Some companies have only one issue listed—usually common stock, or, as it is sometimes called, capital stock. The common stockholder is the owner of the business in a broad sense of the word and he almost always has the right to vote on the directors of the company. Common dividends, which are determined by the Board of Directors, may be increased when business is good; if business is bad, or the Board wishes to conserve cash, dividends may be cut or omitted.

Preferred Stock — This is so named because it is given certain preferential treatment over the common. This usually includes, most importantly:

1. The right to receive a fixed dividend before the common receives any dividends, and
2. A prior claim against the assets of the company in the event of liquidation.

Because of these advantages, preferred stockholders are usually limited in their participation in company affairs. They generally have no voting privileges, except when a specified number of cumulative preferred dividends are defaulted, nor can they usually expect more than their stipulated dividend no matter how prosperous the company may be. If the company runs into hard times the dividend may be reduced or omitted. If it is cumulative, an omitted dividend must be paid before the company may pay any dividend on the common stock. But if the preferred stock is non-cumulative, an unpaid dividend may be lost.

Bond — This is basically an IOU or promissory note, usually issued in multiples of $1,000, although $100 and $500 denominations are not uncommon. A bond is evidence of a debt on which the issuer usually promises to pay the bondholder a specific amount of interest for a specific length of time, and to repay the loan on the expiration date. The bondholder is a creditor of the corporation and not a part owner of the share owner. So long as the company continues to meet its obligations, such as paying interest on the bond, the bondholder is safe. If the bond is due at the rate called for and paying off the bonds at maturity, it has no voice in the business.

A debenture is a form of bond which is backed solely by the general credit of a company and not secured by a mortgage or lien on any specific property. The debenture, which may or may not be convertible into common stock, has a somewhat dubious and painful history and is becoming the most popular form of debt financing.

Bonds, like stock, are an investment. Share owners and creditors alike are interested in the welfare of a company. It is very much the same way that a man's family and the bank which lends him money are both interested in his financial well-being.

I must caution you to note upon purchase whether or not the bond is subject to call before maturity. If it is, the issuer has the right to redeem the bond at a stated price before the maturity date. One must avoid paying too high a premium for a bond (that refers to the present market price well over the current call price), in order to avoid the possibility of unnecessary loss. The current value of a bond will fluctuate with the general interest rate market so that the current yield will equate itself with the going interest rate.

There are a wide variety of bonds: railroads, industrials, utilities, U.S. Treasury and tax exempt (used by state and local governments). The latter have become extremely popular of late among the modest sized portfolios. Further research on the New York Stock Exchange or a small regional stock market will be helpful.

After this research, your question might still be what exactly influences the securities market other than its inherent characteristics.

A. International Political and Economic Situation.
B. Domestic Political Scene.
C. Labor Union Activities—settlements or strikes.
D. Automotive Production and Steel Production.
E. Railroad Carloading Reports.
F. National Association of Purchasing Agents Reports.
G. Retail Sales Figures.
H. And many more I could mention.

This is just to illustrate my point that the matter of investing one's hard-earned dollar employs the same principle of research and analysis that the Electrical Engineer employs in his laboratory.

Miss Marro will be pleased to answer specific questions of Bridge readers. Address questions to Miss Shirley M. Marro, Financial Editor.

The Bridge of Eta Kappa Nu Dept. of Electrical Engineering University of Illinois Urbana, Illinois

PHILADELPHIA (from page 19)

Seated at the head table were the faculty advisor of Beta-Alpha Chapter at Drexel, Mr. Alan Glazer and his wife; the faculty advisor of Lambda Chapter at Penn, Dr. M. O. Salati, who is presently Eastern Regional Director of HKN and is the brother of Dr. Thomas E. A. J. Bauml, President of Lambda Chapter at Penn, and his wife; the Dean of the E.E. Dept. at Villanova, Father Muller; the faculty advisor of Delta-Mu Chapter of Villanova Mr. Joseph Hicks; and the Guest Speaker Mr. Howard Sheppard and his wife.

Mr. Sheppard is a graduate of the Univ. of Penna., the Vice President of the Utilities and Power Dept. of Rumsey Electric Co., and presently the Natl. Vice President of HKN.

Mr. Sheppard spoke about the current activities of the national organization, which is suggested to the engineering students that they become Registered Professional Engineers. Mr. Sheppard felt strongly that this registration will have significant long-term effects by improving the image of engineers held by the general public.

Dance music was provided by the full 15 pieces of the Penn Band. Dance Band, under the direction of Dr. F. L. Howard, will be held immensely and were very enthusiastic in their compliments.

The entire affair was a fine success, and it appears that it becomes better and better.

We are sure that many other schools which have chapters close to each other can benefit by combining together and enjoying the savings possible with a large group.

This type of affair can also serve as a starting point for more interchapter activities.

(Continued on next page)
Some profit of $354.00. Who said engineers are poor economists? Most general got the time devoted by one chapter in slide rule and other tutoring sessions. This type of technical and unsual activity was regarded as very highly desirable.

It is the hope of the N.Y. Alumni Chapter that the above brief description of the academic and social activities and reports will help the chapters in improving their programs and reporting.

Most reports submitted served as proof of the countless hours of service provided by the chapter members in the true HKN tradition.

Credit should also be given to the Awards Committee who have given many hours in reading and screening the reports: Dr. Frederick A. Russell, Awards Committee Chairman, Newark College of Engineering, N.J.; Philip F. Carl, Jr., chairman, Bell Telephone Laboratories, N.J.; Bruce Ross, American Electric Power Service Corp., N.Y.C.; William T. Mahon, Bell Telephone Laboratories, N.Y.; James V. Hopkins, American Electric Power Service Corp., N.Y.C.

Among activities sponsored by Alpha Chapter last fall was a moving talk on application of Jet Propulsion Laboratory, on the successful Ranger VIII mission. The complete series of photographs taken by Camera A was included. Over 100 students from different colleges of the University saw the movie.

The "E.E. Handbook," a review of pertinent information used in E.E. classes, was published. A second edition is about to be published after three years of preparation.

Also on the list of activities was the Alpha Chapter sponsored Professional Engineering Exams Refresher Course and the Master Thesis projects file, compiled in part by the members which included 10 students from staff members as part of their thesis projects. The outstanding student award, formerly presented only once a year, is now given annually. The winner for 1964 is June to the senior who best represents actually the character and education of the class. Work is presently taking place on the making of a complete set of the magazine, which is expected to have collected in the selection by the end of the year.

Finally, the guest speaker program, designed to bring the bi-weekly meetings speakers from the campus computer center, was most fortunate to have Dr. James H. Irvin, who presented a talk on the development of the transistor.

BETA, Purdue University—Began its academic year with the annual series of undergraduate seminars for all E.E.s. In October, the topic areas ranged from space communication to radar systems. Student attendance indicated the general interest and importance of this program.

One chapter located in Halifax, Nova Scotia, 100% per cent, a student could insure himself with a coverage of up to and including seventy-five cents. This particular chapter made a hand

The New York Alumni Chapter of HKN had again the pleasure to select the outstanding college chapters, and honor them accordingly. Traditionally four regional awards and one national award are made for the best chapter report submitted by a student chapter located in the various parts of the country.

Eastern Region—Beta Pi Chapter, City College of New York.

East Central Region—Beta Sigma Chapter, University of Kentucky.

West Central Region—Gamma Theta Chapter, Missouri School of Mines.

Western Region—Tie between Gamma Chi Chapter, New Mexico State and Rho Chapter, University of Colorado.

The Western region presented an unusual problem since both chapters were rated so closely in the competition. It was very difficult to select a winner. In all fairness it was decided to tie the honor and the two chapters were presented.

While the selection of the regional winners was a difficult job, the selection of a national winner was an impossible one. Several of the regional reports were so excellent as to be considered for the National Award. Each of these reports was preeminent in one respect, and it was impossible for the Committee to combine the reports to give one winner. Hence, the committee decided that no National Award be made this year.

It may be of interest to the various chapters to learn something about the methods used in selecting the winners, and some of the outstanding features of the most excellent reports.

The committee members usually do not know the various awards and the activities of the chapters. It is most important, therefore, that the report in its content and appearance, reflects the true nature of the chapter. The composition of the report is judged among other things on:

1. Appearance of Report:
   a) the cover should be clean and professional in appearance.
   b) the report should be neatly typed.
   c) samples of work through pictures are most helpful.

2. Organization of Report:
   a) numbered pages and a table of contents is desirable.
   b) each section should have an appropriate introduction.
   c) the report should preferably be divided in parts or sections.
   d) the number of student chapter members should be given, and each member should be listed with the number of hours devoted to its accomplishment.

3. Character and Style of Writing:
   a) the writing should be informal in the engineering sense of the word. The report should be to the point, and should avoid long passages which would detract from the general information. Weight is not a substitute for good reporting.
   b) the report should be written in a factual, yet interesting style.

Most reports submitted met with the various points mentioned above. Some reports contained a very brief "summary of activities" which was very helpful to the committee.

In judging the activities, various aspects were considered:

1. Activities designed by the chapter to help others.

2. Activities carried out cooperatively with other groups solely to benefit those other groups.

3. Activities which were mutually helpful to HKN chapter and others.

In considering the various activities the size of the chapter was taken into consideration. The average time per member to carry out the activities provided a weighting factor. New activities requiring initiation and organization carried more weight than continuing activities. In considering the regional chapters for the National award, regional characteristics had to be considered. Guest lecturers have been viewed as highly desirable, but had to be regionally weighted in accordance with the local availability of such people. The committees also had to consider the amount of cooperation that was made available. A spectacular group effort of one large chapter was balanced by an interesting trip to a neighboring state by an individual who was chosen by a small chapter to promote good will among engineers to the students.

One chapter made laboratory insurance protection available to all students. For the low fee of fifty cents, a student would insure himself with a coverage of up to and including seventy-five cents. This particular chapter made a hand

(Continued on next page)
Lambda University of Pennsylvania  

The annual meeting of the Electrical Engineering Students' Association was held. The meeting was attended by a number of faculty members and students from various departments at the university. The meeting was successful in providing a platform for discussions on various technical and academic issues. Many students expressed their interest in joining the association.

In the upcoming year, the association plans to organize various events and workshops to enhance the learning experience of its members. The association also plans to collaborate with other engineering societies to provide a wider range of opportunities for its members.

The association aims to continue its mission of promoting technical excellence and providing a supportive community for its members. With its active and engaged members, the association is well-positioned to achieve its goals and make a positive impact on the engineering community.

The next big project to be considered is the biannual Techno-Show to be held in May on the Michigan Tech campus. Tentative plans include organizing the activities of the IEEE Chapter and campus to ensure a successful event. The project is expected to be a challenging task for all.

Betaphila, University of Michigan  

The first meeting of the Beta Gamma Chapter of the Delta Chapter of the national society was held in November. The chapter plans to organize various events and workshops to enhance the learning experience of its members. The chapter also plans to collaborate with other engineering societies to provide a wider range of opportunities for its members.

In the upcoming year, the chapter plans to organize various events and workshops to enhance the learning experience of its members. The chapter also plans to collaborate with other engineering societies to provide a wider range of opportunities for its members. With its active and engaged members, the chapter is well-positioned to achieve its goals and make a positive impact on the engineering community.

The chapter aims to continue its mission of promoting technical excellence and providing a supportive community for its members. With its active and engaged members, the chapter is well-positioned to achieve its goals and make a positive impact on the engineering community.
The second and third meetings of the "Capstone" group of the Student Senate were held to discuss upcoming election and meeting procedures. The election of pledges follows recommend- ed guidelines set forth by the National Fraternity. One of those eligibility for membership and participation in the Kappa Nu is the demand that all new members be of high character and that they be in good standing or in good faith with their previous schools and community. These qualifications are set forth in the bylaws of Kappa Nu and are strongly enforced.

The pledge meeting was held in the new engineering building in which the fraternity is housed. The fraternity is one of several organizations that will be housed in the new building, which is currently being constructed.

The highlight of the quarter was the induction banquet in which the fraternity inducts new members. The banquet was held on Friday night, May 15, at the Kappa Nu house. The fraternity has been in existence for over 50 years and has a long and distinguished history.

BETA THETA, Massachusetts Institute of Technology — This term's pledge social was held at the home of Mr. and Mrs. John Smith on Saturday evening, February 10. The event was well attended, with over 100 members and guests in attendance.

The event featured a buffet dinner, speeches by the fraternity's leaders, and a dance. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of Pennsylvania — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of Oregon — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of California — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of Illinois — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of Michigan — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of Texas — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of Wisconsin — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, Duke University — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, Pennsylvania State University — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, Rutgers University — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of Southern California — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, Stanford University — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of California at Berkeley — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.

BETA THETA, University of California at Los Angeles — The fraternity's annual initiation ceremony was held on Friday evening, May 18. The ceremony was attended by over 200 members and guests.

The event featured a formal address by the fraternity's leaders, as well as music and dancing. The evening was capped off with a formal address by Mr. Smith, in which he praised the students and their dedication to the fraternity.
plaque will be established and main-
tained byEta Kappa Nu in the Electrical
Engineering Department for the
purpose of publicizing the Sophomore
Award and recognizing its recipients.
Each year the recipient will receive a
commemorative gift donated by the ac-
tive members of the chapter and have
his name engraved on a brass plate and
attached to the plaque.

DELTA ETA, University of Western
Kentucky — On May 2, 1964, five new
members were initiated into the Delta
Eta Chapter. After the initiation, a
banquet was held and the chapter was
fortunate to have in attendance both
Professor H. G. Keppeler, National
President HKN and Chairman of the
EE department at Washington Univer-
sity, and Professor P. K. Hodson of the
University of Illinois, National Execu-
tive Secretary of HKN. To his great
surprise, Professor Hodson was the
after-dinner speaker.
The chapter has made plans to pro-
ceed on a more permanent basis and
has decided to hold its meetings at the
Red Barn in Chicago for all members
and their guests.

Presently, Delta Eta Chapter is en-
gaged in designing lighting equipment to
be used for the Spring water ballet
show at Mt. Holyoke College. The lights
will be attached to the swimmers and
used underwater during the perfor-
mance.
Weekly movies have been shown by
the chapter on various phases of elec-
trical engineering. These movies are
open to the public without charge. The
Outstanding Senior Award Committee
has started its work to select one
senior electrical engineering who has shown
excellence in scholarship, leadership,
and interest in his profession and his
school.

DELTA ETA, Louisiana State Uni-
versity — The Delta Eta Chapter of
HKN has held its initiation for the
third year, and as usual, the chapter
had the cooperation of the D. E. C. P.
with the Department of Electrical
Engineering. Each year the chapter
interest them with majoring in E.E.
Although we feel that the time spent for
improvement in this vicinity we hope
that it will become an annual event and
encourage many students in to
the field of electrical engineering.

DELTA KAPPA, University of Maine
— This past semester the major projects
of Delta Kappa Chapter has been the
holding of tutoring sessions for sopho-
more members of the Electrical Engi-
neering class and maintaining the de-
partment reading room.
On November 11, 1964, the student
members of HKN served as guides in
a program sponsored by the Main Branch
of IEEE, to show high school students
some of the opportunities available in
Electrical Engineering.
Properly plans are being made for
extending the tutoring sessions to in-
cluding other engineering classes. Plans
are also being made to engrave badge rules during the spring semester.
In the past this has been found to be a
very profitable venture.

DELTA Eta, University of South-
western Louisiana — Delta Eta Chapter of
Eta Kappa Nu is now starting its third
active year on the campus of the
University of Southwestern Louisiana.
Eight new members were initiated into
the chapter December 14, 1964, increas-
ing the membership to 14 active mem-
bers.
This year Eta Kappa Nu will sponsor
the Department of Electrical Engi-
neering during the Engineering Days
activities May 5 and 6. All members
will take part by either presenting their
own project or assisting the Electrical
Engineering Department.
A large wooden copy of the shield,
made by Frank Costa, will be used to
improve the initiation ceremony and
make it more meaningful to those being
initiated. Plans for the future projects
are now underway.

DELTA PHI, University of South-
ern California — On November 24, 1964, six
new members were inducted into Delta
Phi Chapter of Eta Kappa Nu. Following
the initiation, a banquet in honor of
the initiates was held. The speaker
was Dean C. H. Witten of the University of
Southern California, whose topic was on
the history of the University of Southern
California. The chapter was in the fall semester also saw the
publication of the "Delta Phi Engineering
News" which contains various articles on
the activities of the engineering so-
cieties on campus.
In February, the chapter will co-
operate with the other engineering so-
cieties to make the Second Annual En-
neering Exposition at which last year's exposition was a tremendous suc-
sess, and we hope that it will be an
even bigger success this year.

DELTA SIGMA, University of Notre
Dame — Delta Sigma Chapter began
the fall semester with a seminar in
October on graduate schools. Members
of the faculty of the Electrical Engi-
neering Department and of the School
of Business Administration discussed the
factors which might influence those
planning on graduate study. In this
same area, plans are now being made
to assemble a collection of graduate
school catalogs for the use of next
year's seniors.
In conjunction with the local IEEE
chapter, we also sponsored a lecture
and panel discussion on opportunities
for electrical engineers in industry. The
panel was composed of five employment
interviewers from major firms as well as
the Notre Dame Placement Director.
This semester we accelerated an
effort to contact former Notre Dame
students who were graduated before the
founding of Delta Sigma Chapter, with
the intention of initiating them as
Pro-
fessionals. Six students in this fall initiated, all members were in-
ducted, along with one graduate student
and one associate.
A banquet for all members, the fac-
ulty, and their wives followed the in-
itiating ceremonies. Our guest speaker
was Professor Edward A. Fischer of
the Communication Arts Department,
who is currently writing, producing,
directing, and acting in a television
serial. Professor Fischer spoke on the
value of engineering degrees.
A small group of students was initiated
by Professor Fischer, and by our thanks
for his lecture.

SONNET
Shall I compare thee to a summer's day?
Thou art more lovely and more temperate:
Rough winds do shake the darling buds of May,
And summer's lease hath all too short a date:
Sometimes too hot, the eye of heaven shines,
And often is his gold complexion dimm'd;
And every fair from fair sometime declines.
By nature's changeful course untrimm'd:
But thy eternal summer shall not fade
Nor lose possession of that fair thou ow'st
Nor shall Death brag thou wanderest in his shade.
When in eternal lines to time thou goest:
So long as men can breathe, or eyes can
see,
So long lives this, and this gives life to thee.
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