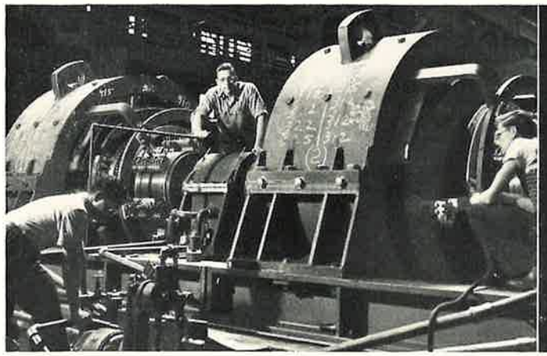
Volume 50 FALL, 1953 Number 1

THE BRIDGE

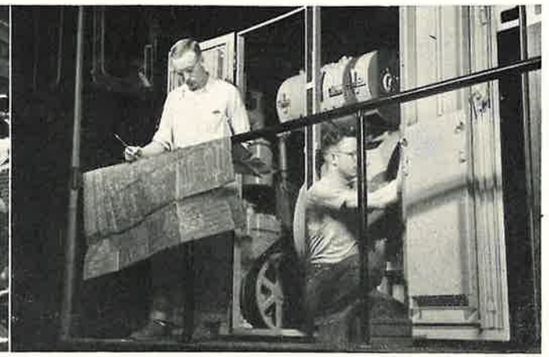
OF

ETA KAPPA NU

IN THIS ISSUE



CHARLES SNYDER, R.P.I., (center) adjusting 5250 triple-unit d-c mill motor for use in a steel mill.



Engineers RICHARD RENK, IOWA STATE, (left) and ALLEN FRINK, CATHOLIC UNIV., make last-minute check on 1600-hp diesel-electric switcher before it is moved to test track.

THEY'RE "GOING PLACES" AT GENERAL ELECTRIC

Like these young men pictured here, hundreds of scientists, engineers, chemists, physicists and other college graduates are "getting ahead" fast at General Electric . . . . and they are working on projects with the assurance that their contributions are meaningful and important.

They are moving up rapidly because at General Electric a world of opportunity awaits the college man of today—a world limited only by his own ability and interest. The variety of General Electric products and the diversity of the Company's operations provide virtually unlimited fields of opportunity and corresponding rewards, both materially and in terms of personal satisfaction to young men who begin a G-E career.

New developments—in silicones, electronics, semi-conductors, gas turbines, atomic power, and others—springing from G-E research and engineering, are creating exciting new opportunities, and are giving college graduates the chance of finding satisfying, rewarding work.

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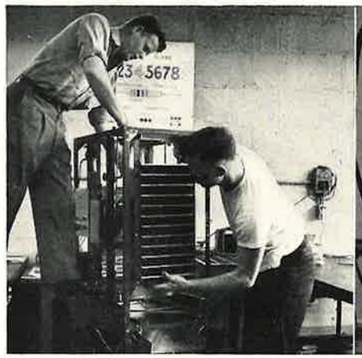
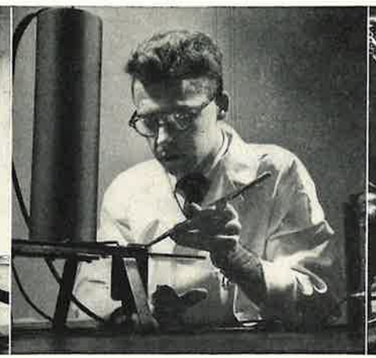
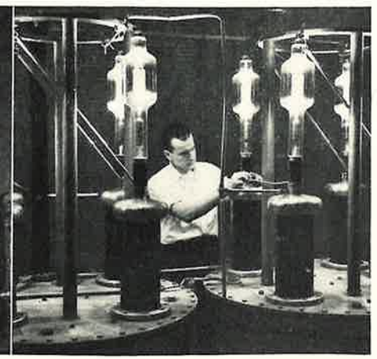
If you are interested in building a career with General Electric see your college placement director for the date of the next visit of the General Electric representative on your campus. Meanwhile, for further information on opportunities with General Electric write to College Editor, Dept. 2-123, General Electric Company, Schenectady 5, New York.



Test engineers E. K. VON FANGE, U. OF NEB., (left) and R. E. LOVE, U. OF TEXAS, work on stacker and stapler built by them for homework project.



Physicist ROGER DEWES, BROOKLYN POLY., working with scintillation counter in G.E.'s Engineering Laboratory.



ANTHONY TERZANO, PRATT INSTITUTE, checks connections on direct-current rectifier which charges 7,500,000-volt impulse generator in G.E.'s new High-voltage Laboratory.

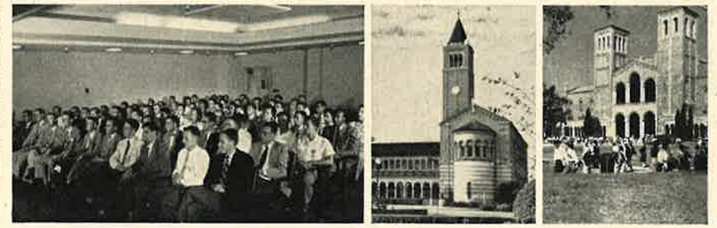
GENERAL ELECTRIC

ENGINEERS *and* PHYSICISTS

To those interested in advanced academic study while associated with research and development in industry, the following practical programs are offered:

1 HUGHES COOPERATIVE FELLOWSHIP PROGRAM

for Master of Science Degrees



A group of participants in the Hughes Cooperative Fellowship Program (above left). Fellows study for Master of Science degrees at either University of Southern California (center) or University of California at Los Angeles (right).

This program is to assist outstanding individuals in studying for the Master of Science Degree while employed in industry and making contributions to important military work. It is open to students who will receive the B.S. degree in Electrical Engineering, Physics or Mechanical Engineering during the coming year and to members of the Armed Services being honorably separated and holding such B.S. degrees.

Candidates must meet entrance requirements for advanced study at the University of California at Los Angeles or the University of Southern California. Participants will work full time at the Laboratories during the summer, and 25 hours per week while pursuing a half-time schedule of graduate study at the university.

The salary will be commensurate with the individual's ability and experience. Tuition, admission fees and books for university attendance will be provided. Provision is made for an allowance to assist in paying traveling and moving expenses from outside the Southern California area.

2 THE HOWARD HUGHES FELLOWSHIPS

in Science and Engineering

(From left to right) Hughes 1952 Fellows Truman O. Woodruff and Allen I. Ormsbee discuss tube processing station in Electron Tube Laboratory with 1953 Fellows Roy Gould and Baxter H. Armstrong. Their advanced study is at California Institute of Technology (above).

Eligible for these fellowships are those who have completed one year of graduate study in physics or engineering. Successful candidates must qualify for graduate standing at the California Institute of Technology for study toward the degree of Doctor of Philosophy in physics or engineering. In summers they will work full time in the Hughes Laboratories in association with scientists and engineers in their fields.

Fellows may pursue graduate research in the fields of physics, electronics engineering, electronic computing, aerodynamics, propulsion engineering, mechanical engineering, or information theory.

Each appointment is for twelve months and provides a cash award, a salary, and tuition and research expenses. A suitable adjustment is made when financial responsibilities of the Fellow might otherwise preclude participation in the program.

HOW TO APPLY: *For complete information concerning either of these Hughes Fellowship programs, consult your Placement Officer or write directly to us. Please indicate the particular program in which you are interested. A detailed explanatory brochure and application forms will be mailed promptly.*

Address all correspondence to

HUGHES

RESEARCH AND DEVELOPMENT LABORATORIES
COMMITTEE FOR GRADUATE STUDY
Culver City, Los Angeles County, California

THE BRIDGE OF ETA KAPPA NU

Volume 50 FALL, 1953 Number 1

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NATIONAL DIRECTORY

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Getting Ahead in Engineering

By JOSEPH GILBERT

Managing Editor, SAE Journal
Society of Automotive Engineers

Presented at joint meeting of New York Alumni Chapters of Eta Kappa Nu and Tau Beta Pi, April 16, 1953.

Did you ever sit back and take a penetrating look at some of your colleagues in the engineering department, and find that each one has a particular trait that sticks out like a sore thumb? And has is occurred to you, as it has to me, that this one peculiarity is what's holding up this chap's progress in the department or company, or is responsible for his success? There are a few fellows that come to my mind and I'm sure you'll recognize them as people you've worked with.

Remember HERBERT, THE HERMIT? He's the guy who wants to bury himself in a corner with his oscilloscope and slipstick, wants no interruptions from others, never says boo to the other guys in the department.

Then there's LOUD-MOUTH LOUIE, the exact antithesis of Herbert. He's always blowing his own horn, getting his nose into everyone's business, whether he's welcome or not; has a pat answer for problems you've spent months trying to solve.

FUSSY FRANK is the fellow who worries about the details, never thinks in terms of results. He'll get his calculations right down to the tenth significant figure, unaware that he has used the wrong formulas to begin with.

GUS, THE GRIPER thinks everything is lousy . . . the company, the management, the policies. He's so busy kicking and carping he never has the time to do something constructive that'll expose him to the plus values of the organization.

MONEY-MAD MAC is in his glory these days. At the drop of a want ad, he'll tell you about 12 different companies that'll pay him twice as much for carrying half the responsibilities he has in his present job.

ALIBI AL has made a science of finding all the reasons why it can't be done. Ask him to investigate the premature failure of a valve in an experimental engine and you can bet your bottom dollar that you'll never get a report. Instead, you'll get a lengthy oration on the lack of cooperation from the boys in testing, or that there's a six-month delivery on the particular strain gage he needs to run his tests, or that the "poor excuses for engineers" assigned to assist him are slow as molasses in analyzing the test data.

LUCKY LES is the guy who gets all the breaks. Comes a tricky problem he's given to handle, he "stumbles" over the answer in two days instead of the two weeks most fellows would take. And it's his project report that gets to the vice-president and draws a complimentary note from same. Now, this all happens just about the time the assistant chief engineer is transferred to another division. So Les, the lucky stiff, gets the job over five other fellows who have been around twice as long as he.

Maybe Les is lucky. At least I used to think so. But I'm now inclined to believe that Les has been making his own breaks. The Les I'm thinking of is a composite of a lot of successful fellows I know . . . design engineers, field service men, researchers, production engineers, and industrial engineers. As I took a closer look at this composite Les, I began to see that he planned it that way . . . laid the groundwork for the breaks, worked for them.

Ask Les what is his gimmick, and here's what he'll tell you: "The scientific method is as much a part of the engineering approach as eating and breathing is to staying alive". And Les sees himself and the attainment of his career goal as just such a project. He considers himself a product to be shaped to serve a particular end use, just as are the electronic circuits he designs, the engines he develops, the operations sheets he writes for machining a part.

Says Les, "When we design a machine, company management has to decide what it will be and do . . . will it be an engine for a Piper Cub airplane, a power lawn mower, or a motor boat. *So I too must decide what kind of an engineer I'll be 5, 10, or 20 years from now. Do I want to be a sales engineer, direct research, or run a factory?*

"After the company decides what product it wants to manufacture, it determines what characteristics, features, properties are wanted in such a product by the customer we want to sell it to. *And the same holds for myself and my professional career, says Les. What will the boss want who'll buy my services for the job I'm after?"*

Deciding What You Want to Do

Les will tell you he had quite a discussion with himself in deciding what he wanted to do. He first asked himself what engineering assignments he liked the best, what sort of things he derived the greatest satisfactions from. He also talked to fellows in his own company in upper echelon jobs; men from other companies, too. He asked them what they felt it takes to make a go of it in their work.

A RESEARCH DIRECTOR told Les it takes a fellow who likes to deal with things rather than with people, to succeed in research work. The man should have patience, be able to isolate himself in the lab and feel that getting the data and analyzing them is the most important thing in the world.

A SALES ENGINEER told Les that persistence, a tough skin, and a somewhat extrovert approach to things and people were major ingredients in his work.

A CHIEF ENGINEER saw in his job the need for leadership ability, dissatisfaction with the status quo, interest in business matters (budgets, costs, sales, marketing problems), and ability to sell ideas to top management.

A PLANT MANAGER told Les his key was coordination . . . tying together plant planning, layout, inspec-

tion, manufacturing departments to meet delivery schedules laid down by management. This man thought nothing at all of being roused at 3 a. m. to get down to the plant because a major die broke or because a fire broke out in the paint shop.

The Les you talk to may tell you he derives real pleasure from exploring in the theoretical realms, that drawing general conclusions from specific data is his cup of tea. Or it may be that he gets charged up from creating mechanical devices. Perhaps he's enamoured of machinery, likes to work with machines, get them to operate, get his hands dirty, enjoys trouble-shooting problems offered in field service engineering. Or he may draw his satisfactions from creating engineering objective, coordinating and leading the efforts of other engineers toward achievement of a common goal.

Les will tell you he found that what he likes to do is probably what he's best at. And he has matched these basic skills against the various kinds of engineering work. Then he sets his sights on the one kind of job that suited him best. Les knew what qualities he lacked. So he eliminated from consideration those jobs which depended heavily on these aptitudes. Next he plotted the course he would have to take to reach the goal he was after.

One Les I know found early in his engineering career that he wanted to devote his career to metal-cutting research, and at the same time achieve some financial success. Being a mechanical engineer, he went back to college nights to earn himself both an M.S. and Ph.D. in metallurgy. Meantime, he was working in the research department of a large machine tool company.

After Les felt he had under his belt the training he needed, he and two of his colleagues took the plunge and went into consulting business for themselves.

Today, Les is still several years short of 40. But he is a partner in a thriving business which just erected its own building. His firm has probably the largest metal-cutting research group in the world. And his company is doing an outstanding job in helping jet engine makers find ways to fabricate hard-to-machine alloys.

This Les, like others you may know, had a plan, but kept it flexible. He realized that in creating a product, you never entirely freeze the design. Changes in market conditions, available equipment, materials or competitive products may force a redesign. So in shaping his career, Les accepted changes and modified his career plans accordingly.

Selling Your Aptitudes

Another Les I know found, after eight years of drifting from one engineering job to another, that sales engineering was his forte. And earthmoving machinery was what he wanted to sell. This Les felt he had one big obstacle to hurdle: Getting a sales engineering job without any such prior experience. But he showed a big earthmoving manufacturer that he could handle the work, and sold the prospective employer on buying Les for a job opening he had. And here is how he did it:

Les studied the company's business and products before the interview, learned something about its markets. He was able to draw from his experiences examples of how he had provided service instead of selling someone a bill of goods (which is sales engineering at its best). And his ace in the hole was a tattered ad, clipped from a foreign-language newspaper by Les while on an overseas project, which advertised this man's machinery. Said Les, "You see, I had made up my mind some time ago that your company was the one for me." Les was hired right then and there.

So far so good, you tell Les. "I get the angle on laying out for myself, setting up objectives for a career. Suppose I even get my first job. What assurance have I that I'll get to this goal of chief engineer or factory manager," you ask him. "It's just the breaks I get . . . if I get a couple along the way, I'll reach my goal, or come close to it. There's also a fifty-fifty chance that I'll get hit with bad luck, too."

"'Tain't necessarily so," Les will reply. "Remember, you are competing all the time with others for better jobs, just as your company is competing with others to sell its products. The man who offers his customer a little something extra is the one who sells his wares. And the one who gives of himself somewhat more on the job than what's expected from the norm gets the promotions and salary increases. Leave it to chance and you take pot luck. And by giving a little more," says Les, "I don't mean coming to work an hour before the office opens and leaving at 6 or 7 every night. I do mean applying more of your overall abilities in day-to-day work."

"The way I figure it," continues Les, "the boss and the company are the ones I've got to satisfy. And in any company the boss wants people who will make money for him, save money for him, or help the company or department team mesh more smoothly. In every assignment I'm given I keep this fact of life in mind," said Les.

Another Les I know showed me where such thinking paid off for him. He lost his job as sales engineer for a large truck manufacturer because of personnel cutbacks. Finding a new job looked like a tough proposition. He wrote the usual resumes containing the usual chronological data—where he worked, and his duties, and dates of employment. But he didn't even get a nibble.

When this Les ran into the Man Marketing Clinic he suddenly realized that the only reason a company would pay him *a salary is because he could make money for it. So here, in part, is how he changed his resume to read:*

"In four years as sales engineer with Aerocar Co., I sold 50 heavy-duty gasoline and diesel trucks to accounts which had purchased only 21 units in the previous 11-year period.

"I introduced Aerocars into Hemisphere Sugar Co. and the Carter Division of Progressive Chemical Corp., two accounts which Aerocar never before had been able to crack."

. . . and much more of the same.

He got a sales engineering job in short order with a major supplier of railroad equipment.

Three Musts for Getting Ahead

Success on the job depends on three things, Les once told me in quoting from the book, *The Law of Intelligent Action,* by Dr. William J. Reilly:

1. Ability to do the job.
2. Desire to do the job.
3. Human Relations—getting along with people.

At one point, Les was put in charge of a small plant manufacturing automotive accessories. He found that his mechanical engineering background wasn't enough to extract the full productive potential in the plant. So he went to engineering school at night, took courses toward a master's degree in industrial engineering—with emphasis on time and motion study and work simplification. It wasn't long before Les increased the productivity of the plant by more than a third by installing more efficient methods and equipment. The payoff to Les was the title of vice-president of manufacturing and engineering, and the salary that went with it.

Another Les that I heard about found that the rewards are rich if you want *to do the job. He was the supervisor of a plating department in one of the many plants of an aircraft and automotive equipment manufacturer. One day he offered to tackle a tough plant problem that others had failed at or turned down. Les kept at it and came up with the solution.*

The next time a knotty problem arose, the boss bounced it at Les. Again he found the answer. He kept getting bigger problems and correspondingly bigger responsibilities. Les came to be known as the fellow who could crack the tough ones. Today, though still a young man, Les is general manager of the corporation and a sure bet for one of the even higher jobs.

The man who told me this story about Les observed that it also demonstrates another key to success. **"When the company offers you a promotion, don't turn it down, even though it may not be exactly the job you are shooting for. If it takes you in the general direction that you're headed, though the route may be slightly different, take the job. Otherwise you'll be passed by when other opportunities come along.**

Working with People

Ask Les about the human relations side of building a career in engineering and he'll tell you it's the most important ingredient in every job . . . way at the top or at the bottom of the ladder, in ivory-tower research or engineering sales. Les will tell you that no matter what the assignment, you can't succeed in it without the help of other people.

For example, a project engineer depends on his team to run tests, calculate and analyze data; on draftsmen to prepare charts and drawings; on photographers to furnish pictures; on secretaries and stenographers to type up the report; and on the boy who runs the mimeograph machine to reproduce the report. The best engineering mind in the world will be a sure-fire flop if he can't get along with people.

The chief metallurgist of a large tractor and farm machinery company recently told Les of the tragic case of a brilliant young engineer who had every attribute in the book, except the ability to get along with people. The company was tickled pink to get this young man. He did an exceptional job in the production engineering department, and knew he was good, almost too good. He didn't overlook any chance to remind his colleagues of it. Everyone he worked with he rubbed the wrong way. He soon found himself an outcast. No one would work or cooperate with him.

The company felt he was too valuable to lose. So he was transferred to research on the chance that he would be more on his own, less in contact with others. But he succeeded in breeding the same resentments. Repeated talks and gentle suggestions from his supervision did no good. He lost the job, despite his fine mind and an engineering ability bordering on genius.

Wanted: Buttoner-Uppers

Pretty early in his spiel on what it takes to succeed in engineering, Les will tell you that, above all, the boss wants a man who *gets things done.* No matter how big or small the assignment, how much you like or dislike it, complete the job. And in seeing the job through to completion, make use of all your talents. If you give it only 50% instead of 100% of yourself, you're not short-changing anyone but yourself in the long run.

Les will again remind you that for practically every promotion there are six other fellows just as eager and just as ready to take over. Then Les may quote you chapter and verse from *"The Unwritten Laws of Engineering,"* by W. J. King, of General Electric. There are three qualities you must apply in getting things done:

a. Creative energy
b. Resourcefulness
c. Persistence

There's a Les I know who applied all of these in netting a nice fee for his firm, a consulting engineering outfit, and fat bonus for himself.

A foreign client, planning to set up a cigarette making plant in the Near East, wanted to buy a paper making machine. But here was the hitch: The client had only $100,000 to spend. A new installation would set him back half a million.

That didn't stop Les. He scrounged around until he found an old, unused machine, covered with rust and grime on a lot near Philadelphia. Les took a look at the equipment and told the client, "I think I can get it to make paper for you within a month." And he kept his promise, too.

With a small crew of mechanics, Les reassembled the machinery, put new life into old rusted parts, replaced those beyond repair. He got the equipment to operate satisfactorily. Then he had the machinery disassembled, packed and crated for overseas shipment, and prepared from scratch a set of installation drawings which he sent along with the machinery. Not only was the machine delivered in much less time than a new one would have been, but the final cost was well within the client's $100,000 budget.

At this point, the Les I know will be getting his second wind on this business of getting ahead in engineering. He'll tell you that this you should know already—personal appearance plays a big part, too . . . neat and clean clothes and fingernails, haircut and shave.

Expressing Ideas

And Les didn't let me get away before he let loose with both barrels on the importance of communicating engineering ideas in writing. He ended up by quoting Chrysler Corp.'s vice-president and director of engineering, James

C. Zeder, who said: "The average engineering report gives little help to the executive reader whose time is limited. It is hard to find things . . . Instead of being pointed up and emphasized, important facts and conclusions are frequently buried in a mass of detail."

Zeder tells the story of a young engineer who gave birth to a Britannica type epic. He eagerly asked one of the executives if he had read it.

"Read it?" was the reply. "I can hardly lift it."

The Les I know could have gone on for hours with other thoughts on what it takes to get ahead in engineering. But at this point I began to see the light. Maybe the Lucky Les label was appropriate, though not in the sense that most of the fellows applied it. He was lucky not because Dame Fortune showered him with an unproportionately large share of favors. He was lucky because he knew what it takes to make the breaks, did something about it, and was there to cash in when the payoff came.

Know-How—Our Maginot Line

By A. M. ZAREM, Delta '39

HKN Recognition 1948

Stanford Research Institute
Director, Los Angeles Division
Los Angeles, California

In 1934, a famous Frenchman, with knowledge of tactical operations of all the French armies, is said to have stated: ". . . the impenetrable fortifications now under construction will be our lasting security . . . the fortifications of the Maginot Line will make up for any deficiency in numbers which we may have to face in an enemy."[1] The Maginot Line, whose construction was started in 1929, was one of the most remarkable fortresses ever built. It ranks with the Walls of Jericho and the Great Wall of China in its position in history. The Line was 125 miles long and consisted of a variety of fortifications, pill boxes, and so forth, connected by an elaborate system of elevators, underground corridors, and other systems of communication. It cost approximately $500,000,000 and could not be replaced now for more than double that amount.

The Maginot Line was never stormed. The German army invasion of the low countries began May 10th, 1940, and the Germans entered Paris June 14th. The Line was surrendered, after attack from the rear, to the German armies June 16th, a bare 36 days after the invasion of the low countries started. It may be of interest to note that the Germans found there foods, supplies, and munitions to last an army of about one-fourth million men for one year.

On more than any other one thing, France pinned its safety on the Maginot Line. The Line became, in fact, a national philosophy.

Does this example illustrate any lesson for us? What do we Americans seem to depend most upon for our future security? If a public poll were taken, it would surprise no one to find that most answers would fall into two categories. There are those of us who believe that the basis of our security lies in (1) the atomic bomb, and (2) the great American Production Know-How, which will build bigger, better, and more bombs, and deliver them to any possible aggressor.

This attitude should be a cause for real concern. Before we definitely decide our security lies in American Know-How and the atomic bomb, should we not look more carefully into and "behind" these more or less "obvious" answers? There are at least two reasons for careful examination of any such simple answers.

First, is the tendency of human beings in general, and Americans perhaps in particular, to adopt the philosophy of naming something and forgetting it. There was a time when the average man on the street gave a pious answer to the question: "What makes grass green? So great have been the strides of science that today, in answer to the same question, even young folk reply, "chlorophyll!" Yet this answer is with no true meaning for them. It does not explain the color of grass any more completely, and for most of us the whole matter is no better understood today than fifty years ago. There is a very real tendency for us to quench our curiosity about things by giving them a name.

The second reason for worry about pinning our security on know-how or on anything else is that in not examining the basis for our Know-How we may overlook other contributing factors which must be understood because they may be even more important. I should like to develop this matter somewhat further.

I will admit, along with others, that production won World War II. I also take pride in identifying American Know-How with industrial might. There is no question in my mind that we as a country can outproduce any other country in the world; and, indeed, perhaps the entire world on selected items. In this sense, we are the strongest country in the world. However, what is more pertinent, it seems to me, is: will we be able to outproduce other countries in the newer things 10, 20 and 30 years from now. I know and feel with you that the mighty roar of American industry shakes the world. But how did the present advanced state of our technology come about? What is behind this Know-How? What is behind the Magnificent March of Magic which has come from American Industry? In order to answer these questions, we must pause here briefly to discuss scientific research and the role it has played in our industrial development.

[1] Pertinax, "The Grave Diggers of France," Doubleday, Doran & Co., 1944.

Fundamental vs. Applied Research

It has been said quite generally that the function of all research is to make man healthier and happier and to increase his knowledge of all things about him. By fundamental research is meant the study to extend our knowledge of the general laws of nature, how electrons behave, how cells grow and multiply, and so on. Fundamental research has no yardsticks; it has no value, no price; it does not lead to patents. The essence of applied research, on the other hand, is the application of the results of fundamental research to a program aimed at obtaining a definite, preconceived, and useful goal. Clearly enough, fundamental scientific research is the basis for technological advance. Now science means many things to many people. There are those who feel that a television set, the atomic bomb, or a garbage grinder are "science." To resolve the confusion that exists in the minds of many between science and the things of science, it is necessary to go back several hundred years.

Those who have studied the development of the history of science take its most prominent beginnings to be somewhere in the 17th century. From that time man's views went through a dramatic change. A new philosophy was born, based upon experimentation, observation, deductive reasoning, and more experimentation. This over-simplified sequence of descriptive terms is customarily used to describe a philosophic attitude now familiar to all as: the scientific method.

Scientists of the 17th century must have hoped for an early arrival of the tremendous benefits they expected to come from their activities and theories. However, it required nearly two centuries before the practical influence of basic research and scientific progress made itself felt. Progress in the basic sciences and fundamental research was started, of course, in Europe; and fundamental research grew in European universities. By free exchange of ideas we obtained our theories from abroad; and until quite recently, the strength of the United States lay in the practical application of scientific principles rather than in the discovery of new knowledge. This could be expected for a young, growing country with an untapped wealth in resources. As far as the atomic bomb is concerned, we are all supposed to know that the basic discovery of nuclear fission was made in Germany, founded on research done in Italy.

No discussion of science and fundamental research should omit some consideration of the motivation behind basic research. That motivation is curiosity, not the desire for comfort or personal gain. Science is well defined as knowledge of laws of nature gained through curiosity. As Dr. Lee A. DuBridge, President of California Institute of Technology, has stated: "This knowledge of science furthermore does not come labelled whether it is to be used for good or evil purposes. It is just knowledge, which can be used in any way that man desires."[2] It is not to be confused with or taken to be refrigerators, atomic bombs, or garbage grinders. Science, extended by curiosity, has no geographical boundaries—its boundaries are the boundaries of the mind. It therefore shows no partiality to race, color, creed, or national origin. There is no pattern, no law, no rule of behavior we know about which can be used to predict where in this world or when a brilliant mind will appear.

This can be partially illustrated by reviewing the list of Nobel Prize winners since 1901. The Nobel Prizes have been given in five selected fields since that time: physics, chemistry, medicine and physiology, literature, and peace. The results are as follows: In PHYSICS, the English have 14 Nobel Prize winners, the German 11, the American 9, the French 5, the Dutch 4. We should note that the Germans obtained only 1 after 1925. And of the American 9, 6 came after 1936. Surely the Americans appear to be just beginning in the field of physics. In the field of CHEMISTRY, the Germans have 19, the Americans 9, the English 6, the French 6, the Swedish 3. Of the 9 the Americans have, 6 were obtained after 1945. In MEDICINE and PHYSIOLOGY, we are much better; the Americans have 14, Germany 9, England 8, French 3, Dutch 3, and the Russians 2. Of the American 14, 10 have come since 1933. Of the German 9, 3 since 1931. So we see again the newness of American approach to science. Noticeable also is the dark age which descended upon Germany. In the field of LITERATURE, the French have 8, the English 5, German 5, American 3, Italian 3, and the Danish 2. All 3 of the American came after 1930. In the field of PEACE, the Americans have 11, French 6, English 5, the Germans 3, and the Swiss 4. Certainly in the field of Peace Americans lead.[3]

America Leads in Applied Research & Production Know-How

As far as applied research and production know-how activities are concerned, the world has witnessed the most remarkable growth of these activities in America. Toward the latter part of the 19th century competition among countries and in the United States increased to a sufficient degree as to cause industry to turn to science. The results of this activity were so remarkable that industry and science have been wed ever since. It was during this period, toward the end of the 19th century, that a large number of independent investigators—such as, Edison and Goodyear—made their discoveries. This was the period of ingenious men, inventors, who, working alone and applying some of the fundamental research results available to them, made contributions that, in some cases, led to the establishment of entirely new industries.

Systematic research by companies and research departments and laboratories began in the early 1900s. Reflect upon this: ORGANIZED INDUSTRIAL RESEARCH IS ONLY ABOUT 50 YEARS OLD! While atomic bombs, radar, television, and a multitude of devices with synthetic intelligence are commonplace today, the elementary particle of matter which had to be harnessed to make possible these developments was given the name "electron" only about 50 years ago. In 1915 we had about 100 research laboratories in this country; by 1950 we had approximately 3000, employing perhaps 200,000 people. This magnificant growth has been an indication that the American industrialist has come to consider research not as an expense, but rather as a capital

[2] L. A. DuBridge, "The Scientist Calls for Help," California Institute of Technology, 1947.

[3] Regardless of the Russian contention that IT is the only country working for peace—THE EDITOR.

investment, an insurance against technological obsolescence. It is this application of the results of science to industry which has resulted in the MAGNIFICENT MARCH OF MAGIC from our laboratories and our shops. It is this application of science to industry which has developed our Know-How.

Some inescapable conclusions can be summarized here.

(1) If we live in an age of anything, it is an age of science; an age in which the products of science confront us at every turn.

(2) Pure scientific research traditionally grows best in the universities.

(3) Fundamental research precedes and supports applied research, and it is the applied research and the applied science which has given us the automobiles, refrigerators, garbage grinders, and atomic bomb.

(4) Science itself has no direct social impact. It is important that we recognize that the social impact of science begins in the industrial, governmental, and other research laboratories where the knowledge revealed by science is utilized to the making of things, be they for good or bad.

(5) A nation that wishes to be a leader in technology must certainly be a leader in pure science.

(6) Behind good old American Know-How, is good old German Know-How, and good old French Know-How, good old English, Swedish, and Norwegian Know-How, clear down to the Know-How of Pithecanthropus Erectus.

(7) Behind our Know-How stands Know-Why; and just as Know-How is related to applied science, so Know-Why is identified with basic science.

(8) We must recognize the relationship between Know-How and Know-Why, in order that we may put more energy into understanding science. Certainly, we must somehow clear up the popular confusion that exists today and makes people think that an atomic bomb or a television set is science. It is the scientists' responsibility to see that the public is shown the difference between "science, technology, and the practical arts," in order that closer attention may be given to the scientific and technological elements which increasingly have to enter into our national policy.

With these summations in mind then, Is There Security in Know-How? Yes! to a degree. There is the same Security in Know-How as there was in the Maginot Line. It will hold for a time; certainly against frontal attacks in which another country's Know-How is pitted against ours. However, we must realize that Know-How is not exclusively ours. Behind it stands Know-Why, and Know-Why is where one finds it.

In a recent press release, Mr. Gordon Dean, Chairman of the Atomic Energy Commission, was quoted as stating that approximately 20 countries now have enacted laws regarding the control of atomic energy; and that in some 14 countries, Russia being only one of them, atomic research was being pursued. Specifically, Mr. Dean stated: "Atomic energy, on an international scale, is rapidly becoming a factor to be reckoned with in world affairs, aside from its role as a military weapon." It seems clear that Know-How alone will not secure our future. It seems also as clear that Know-Why is at least as important as Know-How; that if we wish to have Know-How in the future, we must continue to develop our Know-Why now. But is this sufficient to insure our future?

Freedom of Enterprise—A Prime Requisite

Clearly a nation that is healthy, a nation whose welfare is preserved, is a nation that can be strong. It is therefore important that we view the welfare of this nation to determine how it has come about. In a larger sense, neither Know-How or Know-Why alone, or even together, has been sufficient to insure our continued welfare. While it is important that we understand the roles that Know-How and Know-Why have played in increasing our productivity and our standard of living, it is even more important to realize that Know-How and Know-Why alone would not be sufficient to bring this country to its present position of leadership. There are other extremely significant ingredients which aided in bringing this about.

The mass of people today believes that further increase in our standard of living must, of course, certainly come about. Many of us really believe that these increases in our standard of living are not only easy, but that they are inevitable, and that our present standard of living developed automatically by some obscure process. There is not a full realization of how much this progress owes, for example, to incentives as they have been available in this country.

Our wealth, our standard of living, our security and our future depend upon a complex combination of things: a free, restless, skilled, vigorous people, their natural resources, and a stimulating economic climate called Freedom of Enterprise. Without this freedom to stimulate the flow from Basic Science to Applied Science, from Know-Why to Know-How, we can stand in danger of losing the future. But neither Know-Why, Know-How, or Freedom of Enterprise stand alone. We must support them all. Tooling physically is in many ways similar to constructing a Maginot Line. It will secure us from frontal attack. It is certainly not sufficient. We must tool mentally as well, lest we become vulnerable from behind, from the direction of pure science. Finally, it is part of our responsibility, if we believe these things, to see that the public in general is informed in order that it may act intelligently in any crisis that may lie ahead.

Eternal Truth and Business Management*

By LOUIS RUTHENBURG,

Chairman of the Board
Servel, Inc.

There is an Indiana legend concerning a bill presented years ago to the state legislature. That bill proposed to change the relationship between the diameter and circumference of the circle from the "usually accepted" ratio of 3.1416 to exactly 3. Certainly the proposed change would have simplified many future computations, but the bill did not become a law because a majority of the Hoosier legislators declined to attempt the amendment of an eternal truth.

Most people know that there are many basic natural relationships and laws that cannot be repealed or amended by human legislation. There is the Law of Diminishing Return, for example—universal in operation and unchangeable. The most primitive savage was vaguely aware of that law because he knew that a disproportionate amount of energy was required to run a given distance at twice his normal walking speed. Modern man recognizes its operation in all manner of physical and economical demonstrations. Who is unaware of the enormously increased energy that is absorbed by the 200-mile an hour racing car as compared with the stock car capable of half that speed? Most of us know that increased railway rates do not produce proportionately higher income and that tax rates carried beyond a given point result in reduced total tax revenue. In the Congressional Record a speech on tax policies calls the attention of the legislators to "a law whose penalties can be incurred but which cannot be repealed nor amended by human legislation—the fundamental law of diminishing return."

These laws, which do greatly influence our lives and which have from the beginning of time controlled the universe, operate in all fields of activity—physical, psychological, political, economic, social, astronomical. Their observance determines the validity of moral philosophies. It is an unfortunate fact that their inherent meaning, their implications and their universal and unchanging operation are not more generally understood. The maturity of civilization may be within reaching distance when all departments and aspects of education rest upon a firm foundation of comprehensive knowledge of such laws and relationships.

In these immature, groping, foggy days of our lives, engineering students and physical scientists learn something of these things as applied to their daily chores and research projects. Usually they have little understanding of their universal implications. Our economists catch a glimpse of a segment—again very narrowly applied. But what elementary teaching of this great body of law is included in the curricula of students who devote themselves to the study of the liberal arts, to the study of the humanities and to the study of man-made law and jurisprudence?

There are those whose entire philosophy is derived from the precepts of the Bible or from another of the ancient moral philosophies, or from close communion with nature, whose grasp of basic law, of unchanging relationships, of eternal truth is firmer and more comprehensive than that of many university graduates.

Students of engineering and science learn fragments of the body of law, usually without comprehension of their universal characteristics. They are taught to regard them simply as the formulae and tools of their narrowly defined professions. In technical fields as closely related as mechanical and electrical engineering the practitioner frequently fails to understand that the same laws expressed in slightly different language control both mechanical and electrical phenomena. A glimmering of this truth illuminated his studies when his teacher instructed him by use of such expedients as the hydraulic analogy in explanation of electrical phenomena. But average mechanical and electrical engineers complete their life's work without realizing that a steel spring vibrating from a state of stress to one of rest responds to exactly the same law that controls the discharge of an electrical condenser.

Is it unreasonable to believe that the entire world economy, once released from the stresses imposed by total war, must oscillate with decreasing amplitude exactly in the manner of a recently stressed, presently released spring or a discharging condenser except as, or until, it is influenced by other forces?

One of the most important inventions of the many made by the great Michael Pupin revolutionized the field of telephony. In his inspiring autobiography, "From Immigrant to Inventor," he relates the mental processes by which he arrived at that discovery. As a herd boy in his native Serbia he and his companions learned to detect the movements of the cattle by holding their ears to the ground and hearing the vibrations set in motion by the moving feet of the cattle. They also learned to signal to each other by means of vibrations through the earth, set in motion by vibrating their knives stuck in the ground. These youthful experiences gave Pupin a lasting and basic conception of the transmission of vibrational energy through a physical medium. Many years later he solved the classic La Grange problem which has to do with a cord, loaded at intervals, under vibration. Then, by a brilliant series of intuitive conclusions, supported and confirmed by laboratory experiments and mathematical analysis, he achieved his great invention of the application of inductance in telephone circuits involving the Pupin coil, concerning which he says, "The coil is now known all over the world as the Pupin coil, and many people think that the coil itself is the invention."

Pupin points to the more usual, narrow attitude by relating the following incident: "A professor of

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physics, who often acted as consulting physicist to telephone companies, had such a loaded cord hung over his lecture room table for the purpose of explaining transmission of wave motion from one end of the cord to the other, but he never inferred anything from it regarding loading a telephone line with inductance coils. When I called his attention to it, and joked about it, he blamed his hard luck, implying, I thought, that solving a dynamical problem and building upon the foundation of this solution an electrical invention is a question of luck."

Our greatest philosophers, scientists and inventors are those who have recognized the universal qualities of these fundamental laws. They have understood and used the many dialects in which the great universal laws are phrased in the multitudinous districts and departments of philosophy, science and engineering. they have discovered and illuminated and have understood its derivatives. By virtue of such comprehension they have discovered and illuminated great areas of eternal truth and have bequeathed to mankind vast additions to the sum of knowledge. They are among the greatest benefactors of humanity.

In the textbooks of elementary dynamics we find this expression, "Every action is followed by an equal and oppositely directed reaction." Operation of the law of action and reaction is as obvious in the field of political economy as it is in the area of physical dynamics. The Chief Executive of the United States has encroached upon the prerogatives of the Congress. A "reactionary" Congress came into being. Now our daily newspapers report upon the operation of the law of action and reaction —locus of operation, Capitol Hill. In 1932, directly responsive to the law of action and reaction, the New Deal was elevated to the driver's seat by the sovereign people of the United States after twelve years of conservative government which had in turn captured the reins of government as the result of a national reaction against Wilson liberalism. Democratic government depends very directly upon the operation of the law of action and reaction for its successful operation and perpetuation.

Equally obvious is the operation of the law of action and reaction in the field of labor relationships. In reaction against shortsighted policies of industrial employers a great body of federal law has been enacted to guarantee to industrial labor many rights and privileges. These new rights and privileges and great masses of labor are being exploited by ignorant, opportunistic individuals to such an extent that reaction against the exploitation of labor and public interest by such men is becoming evident.

The Sermon on the Mount gave us the Golden Rule—probably the soundest precept for human relationships that has come to us through the ages. Is the Golden Rule not an inferential expression of the law of action and reaction? Students of religion and moral philosophy testify that similar precepts characterize many moral philosophies much older than Christianity. As a generality, one may reasonably conclude that sound and lasting moral philosophies and religions are consistent with and embody many of the laws which we are accustomed to recognize as more narrowly defined laws of dynamics and economics.

Then there is a bit of eternal truth which, for lack of a better name, we shall designate as the principle of resiliency. A rubber tire survives through thousands of miles of gruelling service, whereas a set of hard steel tire chains will be completely worn out after a few miles of operation. It is obvious that the rubber recedes before impact and abrasion, whereas a more refractory material cannot recede and therefore is quickly destroyed. Great centrifugal pumps used for hydraulic mining and dam building operations and subjected to the terrific impact and abrasion of tons of gravel and sand, wear out within a month when the casings are made of the hardest metals obtainable. When the casings are lined with soft rubber the life of the pumps is increased tenfold. Devotees of the prize ring know that the fighter who 'rolls with the punches' outlasts the pugilist who 'takes it on the chin'.

The same well-known physical principle operates just as definitely in more subtle human relationships. We have all known men of tremendous force of character and driving power in business and public office whose careers have been cut short and made ineffective because they have no ability to adapt themselves to the characteristics of their fellow men. They fail to "roll with the punches." They "take it on the chin". Consequently, their usefulness and length of service are cut short. Under the Christian philosophy we are counseled to turn the other cheek when smitten on the one; that the meek shall inherit the earth. In fact Christian philosophy is replete with teachings that give force and effect to this principle of resiliency."

Not so generally understood are the equally unchangeable mass-velocity relationships. Early in the education of every engineer is encountered the fundamental energy formula: $\frac{MV^2}{2}$. But the implications of this never-changing relationship fail too frequently to enlighten those whose activities and interests lie outside the engineering profession. Back in 1929 it was my privilege to hear a discussion of economic conditions between a man whose opinion is widely sought and respected in matters of advertising, sales and public relationships and an engineer. The super salesman maintained that we could not be facing a period of economic decline and in support of his views he cited a great mass of statistics having to do with the wealth of the nation in terms of bank balances, buying capacity and the like. The engineer disagreed with his analysis because he pointed out that his friend was dealing only with the mass elements of the equation, and was overlooking the velocity element. By the way of illustrating his viewpoint he said something like this: "There is a big locomotive down here in the roundhouse that pulled the Detroiter from New York to this town yesterday at great speed according to its schedule. Today that locomotive is standing still. It weighs exactly as much as it did yesterday but is now without velocity and isn't going any place. So it is with your statistics. You are talking only about mass, and economic mass without economic velocity means that we have lost an essential element of prosperity. Theoretically at least, one dollar passing productively among ten people in one day creates as much prosperity as five dollars passing productively between two people. I have studied this national economic picture from a standpoint of mass-velocity relationships, and I know that we are losing velocity, and in the degree to which we continue to lose velocity we shall lose prosperity. That will be true without regard for any mass statistics that anyone may bring forward in support of the opposing view."

Just as industry is now making vitally important contributions toward national defense, so it must function in the period when defense needs are stockpiled to provide employment, to supply goods and services, to give the complicated national and international economy required velocity. The formula $\frac{MV^2}{2}$ operates with the same immutability in economics that it does in physical dynamics. Immobile wealth is merely inert mass. The processes of industry and commerce supply the element of velocity that is essential to prosperity and to social welfare. Instances in which such eternal principles as the conservation of energy, the principle of inertia and many others in fields far removed from those limited areas in which these laws are understood and observed could be expanded almost without limit. Perhaps it will suffice to point out that more general understanding of these eternal principles in their application to all manner of human and business relationships "wad frae monie a blunder free us".

ETA CHAPTER
Of Eta Kappa Nu

Then And Now

If you are one of our more than 8,000 reader members who graduated four years ago or less, or if you are one of the 1,000 members who are yet undergraduate students, it is very probable that the first time you ever heard of Eta chapter was when you read Article IV of our Constitution, revision of Spring, 1951. In fact, unless you graduated from the University of Illinois in 1905, 1906 or 1907, or from Purdue University in 1906, 1907 or 1908, it is quite probable that you did not know there was an Eta chapter in the early years of our history—and perhaps you are one of the thousands of members who have wondered why "Eta" chapter is omitted from the alphabetical listing of the first 22 college chapters. No, it was not omitted because it is the first letter of our name; there is a more definite and very interesting reason, although it was chosen by our founders because it is the first letter of our name.

As former articles recently published [1] on the early history of Eta Kappa Nu disclose, our honor society (then called a "fraternity") was established October 28, 1904 on the campus of the University of Illinois. The Fall of 1904 and the Spring of 1905 were busy days spent in organizing. Then, near the end of the college year (1905) the group of Alpha chapter, including the founders, several other seniors and some juniors, held what they called a "National Convention"—one chapter—in order to organize a National Executive Council of the founder members.[2]

Sometime in the Fall of 1905 some students at Purdue University heard of the new society started at Urbana. If you were personally acquainted with the enthusiasm of "the ten" you would have a hunch that the Purdue students may have heard of the new society from some member of Alpha chapter. If you think so, there is no evidence to prove that you are wrong; neither is there evidence that this is correct, for neither Brother M. L. Carr nor the student members of Alpha in 1905 would say "yes" or "no" to any later questions about this.[3] (Perhaps for reasons to be disclosed later in this report.)

The EE students at Purdue were so interested or intrigued that they sent James Ray Thomas, Beta '06 (Eta '06) on the journey to Urbana to learn the facts. Yes, in these days it *was* a "journey" although now it is less than two hours drive by auto—no student owned an auto then. Even today it is a wearisome trip by rail, or by rail and interurban or bus.

And was there a scampering around when the brothers at Urbana heard he was going to pay them a visit? A ritual was drawn up in the rough and used the previous winter. The ideals by then were quite well fixed in the members' minds. The Constitution had been written and approved before the first "National Convention" was held—but it had not yet been typed. Brother Carr wrote: "I remember that we began hastily to typewrite it in one room of the same house where we were entertaining Mr. Thomas who had come to Champaign from Purdue, I presume, to "size up the bunch."

Mr. Thomas must have been satisfied, because he requested the privilege of organizing a chapter at Purdue and this privilege gladly was granted. Then, as youth so often enthusiastically but unthinkingly does, the installation of Beta chapter was held before approval of the University Administration was obtained.[4] When the latter heard of the clandestine action, the sparks began to fly. The final result was that Brother M. L. Carr, who had graduated the Spring of 1905, but who was an assistant in the physics department at Illinois and who was then President of the NEC, had to make the journey to West Lafayette and "go on the carpet" of the President of Purdue University. The demand was made that the charter be withdrawn and the membership in Beta chapter be revoked.

[1] See page 1 of "Spring—1953" and page 7 of "Summer—1953" issues.

[2] It should be pointed out here that already our far-sighted founders foresaw that Eta Kappa Nu, a local at the time, soon would become a national.

[3] The writer does recall that each time this question was asked of Brother ML, a twinkle came into his eye.

[4] There seems to be some credence to the report that at the time Purdue prohibited fraternities—at least honor societies.

Fortunately for Eta Kappa Nu, Brother Carr was older than most college students of those days (he was 28) and he stood up for our rights. He acknowledged that the installation of Beta chapter may have been premature and agreed to withdraw the charter. "But," said he, "Once a member, always a member—we will not revoke the membership."[5] The President of Purdue agreed to the compromise.

Then Eta Kappa Nu had some members who, like the man without a country, were not members of a chapter. As a result, the first amendment to our first Constitution was drawn and ratified:

"SECTION 1. Electrical Engineering students and alumni of technical schools of recognized standing where chapters do not exist, who have been received into membership in Eta Kappa Nu, shall constitute a chapter which shall be under the direct control and supervision of the National Executive Council, and which shall be designated by the Greek letter 'Eta.'

"SECTION 2. Three, or more, undergraduate members, conveniently situated, may organize a branch of Eta Chapter. Branches of Eta Chapter shall be governed and shall conduct their business as provided in the Constitution for regular chapters, and shall have all the rights and privileges thereof, except that of electing their officers or new members."

"SECTION 3 Officers of branches of Eta chapter shall be appointed by the President of the Executive Council, from recommendations made to him by each branch.

"SECTION 4. Branches may nominate for membership in the chapter, students who are qualified for membership in this organization. Such nominations shall be approved by the National Executive Council, and the President of the Council shall appoint deputies to conduct the initiation of such students into this organization.

"SECTION 5. Each branch of Eta chapter shall be entitled to one delegate in the National Convention and he shall have all the rights and privileges of delegations from regular chapters.

SECTION 6. When a chapter of Eta Kappa Nu shall have been established at a school, near which a branch of Eta chapter has been in existence, all graduate and undergradute members of Eta chapter in that school shall become members of that chapter without further action.

"SECTION 7. Associate members of any chapter of Eta Kappa Nu may, with the approval of that chapter and of the Executive Council, become members of Eta chapter."

In 1913 the EE administration at Purdue asked for a chapter of Eta Kappa Nu—this request received approvals clear up to the President of the University—and Beta chapter was re-established. In accord with Section 6 of Amendment I, the members (1906, 1907 and 1908) of Eta chapter were then and are now considered members of Beta chapter.[6] Then, in the Constitutional Convention of 1913 (at which, in order to take care of growing conditions, the first Constitution was revised considerably) this amendment was dropped because it was thought it had become "a dead letter."

It will be noted that the final establishment of the present Beta chapter received complete administrative approval. Soon after that, however, there was a similar misunderstanding on another mid-west campus. Fortunately, this occurred before a chapter actually was installed—and by proper negotiations, a chapter later was installed on that campus. THEN, the national officers resolved that Eta Kappa Nu had learned its lesson; that forever after a petition must be approved in writing, not only by the head of the EE department, but by the dean of engineering, the dean of men and the president of the institution—or their equivalent officers of the petitioning school. Your present executive secretary, who was one of the national officers to experience the headache of the second "upheaval" has seen that this has been done. Then in the 1951 revision of our Constitution, it was decided to write this into the new proposed draft (Article III, Section 2 and Article IV, Section 2.)

The New Eta Chapter

For some years the national officers realized that there were one or more EE students graduating from most recognized schools not having a chapter but who deserve the honor of being members of Eta Kappa Nu. Some of these schools today graduate enough EEs to support a college chapter, but nearly half of those EE departments accredited by the Engineers Council for Professional Development are at present too small to support a chapter of Eta Kappa Nu.

This condition became most apparent in the early years of the HKN Recognition of Outstanding Young Electrical Engineers. In the years when the candidates nominated in those years for the Recognition graduated (1927 to 1930) we had a maximum of 23 chapters (those with only one Greek letter to their name) Thus, as we accepted nominations of graduates of any accredited school—and awarded regardless of membership in HKN—more than half of those cited were not members. Gradually we have added other schools to our chapter roll and this percentage, accordingly, is reducing; but 1953 is the first year that the award and the honorable mentions all go to members of HKN. (Membership has been made available through a nearby college to those cited who are not members.)

Is it fair that, because a man chooses to attend a small school (where perhaps he receives more individual instruction) or a school that for some administrative reasons does not have a chapter, he shall be penalized by not having the honor of membership conferred upon him—and thus not be able to participate in alumni chapter meetings after graduation? That situation was discussed in meetings of national officers since 1937. Then in 1951 when our Constitution again was revised, we discontinued discussions and acted. Article IV was written into our Constitution; also Section 9 of Article IX.

ARTICLE IV
Eta Chapter

Section 1. To provide for membership of well qualified undergraduate students pursuing a course in Electrical Engineering in schools in which no college chapter of Eta Kappa Nu is established, Eta Chapter of Eta Kappa Nu is hereby established.

Section 2. A branch of Eta Chapter may be established by the National Executive Council at its unanimous discretion in any technical school of recognized standing as herebefore defined and not having a college chapter of Eta Kappa Nu, upon the written consent of the president, the dean of men, the dean of engineering and the head of the department of electrical engineering, or their equivalents.

Section 3. A branch of Eta Chapter shall be known by the name of the school followed by "Eta." (Example: "X" University Eta, "X" State Eta.)

Section 4. No chapter formal organizations shall be established at any branch of Eta Chapter; the officers of the National Executive Council shall be considered the officers of Eta Chapter. Eta Chapter shall not have a vote in the National Convention.

Section 5. In the event conditions at a school in which a branch of Eta Chapter has been established become such that in the unanimous opinion of the National Executive Council a college chapter could be active therein, then the National Executive Council may encourage preparation and petition for a college chapter as herebefore provided.

Section 6. Upon the establishment of a college chapter at a school in which formerly a branch of Eta Chapter was established, all members of Eta Kappa Nu of that branch shall be known as members of the newly established college chapter.

ARTICLE IX

Section 9. A candidate for Eta Chapter shall be a fully qualified senior in the upper third of his Electrical Engineering class. He shall be nominated by a member of Eta Kappa Nu and endorsed by the dean of engineering and the head of the electrical engineering department of the school in which his branch is located, and must receive the unanimous approval of the National Executive Council. He shall be inducted as the National Executive Council arranges.

During the academic year of 1951-52, correspondence was carried on between members of HKN on the faculty of Duke University, Durham, N. C. The result: May 1, 1952 National President Eshbach authorized a branch of Eta chapter at Duke. The branch elected three seniors the Fall of 1952 and, being approved by the NEC, these were inducted into Duke University Branch of Eta chapter by the officers of Beta-Eta chapter at North Carolina State at Raleigh. A second group of five senior EEs at Duke University will be inducted December 1 at the same ceremony in which Beta-Eta chapter at North Carolina State inducts its Fall class.

November 23rd a petition was received from four members on the faculty of Wayne University, Detroit, Mich., requesting that they and their successors at Wayne University be authorized and commissioned to nominate qualified candidates in the senior EE class for membership in Eta Chapter. The petition was signed by Brothers Howard M. Hess, Beta-Iota '41G, L.S. 240, head of the department of Electrical Engineering; Richard E. Kuba, Delta '44 and Fred Brafman, Beta-Epsilon '43 L.S. 420, assistant professors of EE and Donald V. Stocker, Beta-Epsilon '50G, instructor of EE. It was accompanied by letters of approval as required by our Constitution.

As this issue goes to press, the required unanimous approval of the NEC has been received and the petitioners will be authorized by appropriate certificate to nominate.

Other schools are corresponding about branches and it is anticipated that Eta chapter will contribute to the future growth of our society—both in the way of many excellent future members of HKN thereby, and in many branches of Eta chapter that, in later years, will become chartered college chapters.—AB.

INDUCTEES OF EARLY "ETA" CHAPTER

Class of 1906

Henry Edwin Borger; 19 Pelham Drive, Dayton 9, Ohio.
Carl Emil L. Dapprick; Deceased.
Constantine Luther Herbster; Deceased February 3, 1938.
Marion Loop; Deceased.
George Frederick Peterson; Deceased November 1, 1938.
William Arthur Rush; 444 Eastern Ave., Indianapolis, Ind.
(Instructor Elec. Dept., Arsenal Tech. Schools, Indianapolis.)
W. K. Stacy; 801 Forster Ave., Couer D'Alene, Idaho. (Retired.)
Fred Lee Talcott; Deceased.
James Ray Thomas; Deceased.

Class of 1907

Francis Henry Bagley; Deceased August 29, 1941.
Joseph Henderson Cannon; 12 Ridgeway, Ann Arbor, Mich.
(Prof. of EE—University of Michigan.)
*Clarence Rivers Collins; Deceased November 19, 1951.
*Everett Mathew Greeson; McGregors, Inc., 1886 Autumn St. NE, Memphis, Tenn.
*Leslie Huntington Harris; Deceased 1920. A past president and secretary of HKN.
*Albert Jay Loeb; Deceased.
Albert Finley McKee; Died in Harrisburg, Pa., January, 1932.
*Charles Ruby Moore; Deceased March, 1951.
*Chester A. Scott; 308 N. Norton Ave., Los Angeles, Calif.
(RKO Motion Picture Studio.)
*Roscoe Seybold; Executive Secretary, Purdue Alumni Scholarship Foundation, Lafayette, Ind.
*Frank Joseph Strassner, LS75, 30 Melrose Drive, Livingston 1, N. J.
(President, Harriston Engineering Corp., Irvington, N. J.)
*Harry Newton VanDeusen; Deceased June, 1932.
*Glenn Brubaker Walker; 2175 S. 19th E., Salt Lake City 6, Utah.
*Arthur Wellesley Woodville; 3128 SE Claybourne St., Portland, Oregon.

Class of 1908

Raymond Blaine Best; 4159 Commonwealth Ave., Flintridge, Pasadena, Calif.
M. B. Bogarte; Deceased.
Paul L. Clark; Deceased.
Charles A. Jaqua; 7033 Central Ave., Indianapolis 20, Ind.
(Pres.-Treas.—Scott-Jaqua Co., Inc., Indianapolis.)
Walter Eugene Viol; R. R. No. 6, Lafayette, Ind. (Retired.)
Arthur B. Wagner; Deceased 1930.
Roscoe H. Webb; R. D. No. 1, Murrysville, Pa.
Edward Bion Wintrode; Deceased 1918.

Our national records of membership of this period are scarce and somewhat indefinite. As the 1906 graduates must have been inducted before they graduated, it is apparent they became members the Spring of 1906. It is also apparent that some of the class of 1907 became members in the Spring of 1906. Those of the class of 1907 marked with an asterisk indicate induction April 27, 1907. Thus, these and the ones of Class of 1908 may have been inducted by the early Beta (Eta) chapter the Spring of 1907 and it was then that Brother Carr was called to West Lafayette, Indiana.

[5] That established a policy which Eta Kappa Nu follows today.

[6] But even today some of these write headquarters showing "H" after their name.

BETA-ALPHA CHAPTER WINS

1952-1953 Activities Award For Second Straight Year

Beta, Delta, Omega, Beta-Pi and Gamma-Delta Chapters Receive Honorable Mention

By EMERSON D. CALLAHAN, Beta-Theta '48G
Vice-President (Programs), New York Alumni Chapter

It often has been said that great achievement needs no reward—it provides its own deep satisfactions to those who continue to increase, expand and extend their accomplishments. Nonetheless, there is no greater stimulus to bettering one's performance than competition.

Recognizing the role which competition plays throughout industry in our free nation, the New York Alumni chapter has for the past 20 years presented an Activities Award to the chapter which it judges has compiled the most outstanding record of activities during the school year. Because there always are several chapters whose records are outstanding, the jury awards a silver plaque to the winner and honorable mention certificates to the very close "seconds." This year the jury not only deliberated at great length before deciding the winner, but had even more difficulty selecting the chapters to receive the honorable-mention certificates. It was indeed gratifying to have so many chapters with unusually fine reports, several of which were right on the threshold of receiving honorable mention.

Beta-Alpha At Drexel Institute—Second Time Winner. For the second straight year, Beta-Alpha chapter at Drexel Institute of Technology has been awarded the silver plaque for its impressive record of activities. In fact, its report itself was a masterpiece of design and composition.

In addition to the long list of regular activities which the chapter carries on each year, there were several new ones which show a high degree of diversification and imagination, as well as service. One interesting example took place during the smoker for the juniors and seniors eligible for membership. Each prospective candidate was required to give a five-minute talk on an electrical engineering subject, and during his delivery different members humorously tried to harass him. The candidate's reaction to those intrusions was used as an indication of his ability to carry out an assignment under adverse conditions.

A real contribution was made by Beta-Alpha when it elected to undertake needed projects in conjunction with the opening of a new electronics laboratory at the school. Design and construction of a new laboratory test set for studying antenna radiation test patterns, construction of a TV demonstrator, and establishment of a transient laboratory are just a few of the projects successfully undertaken.

Realizing the growing need for visual education, the chapter has begun to search for the sources of all available technical films and is having them catalogued. Some 28 foreign students attending Drexel during the year were entertained by Beta-Alpha to help combat any "homesickness" they may have had. Several correspondences have begun as a result of this wonderful display of brotherhood. To round out the already well diversified program, the chapter competed successfully in intersociety athletics, and sent a delegation to help install Gamma-Kappa chapter last spring in Newark.

Only the unusual, new, and different areas of activity have been mentioned here. The chapter also participates with great enthusiasm in many school, AIEE and IRE programs. See chart on pages 16 and 17 of Summer—1953 issue.

Our hats are off to you, Beta-Alpha, for a record that will be mighty hard to beat. ***And we are fully aware of the fact that you are a co-op school with half of your members "on their work schedule" at all times. Chapters in other co-op schools which always think they have no chance of winning this award, should take note.***

HONORABLE MENTIONS—NOT RANKED

1. Beta Chapter of Purdue, a former double winner of the plaque and recipient of an honorable mention last year, has again had a banner year of activity. Particularly noteworthy is the thoroughness displayed in its election procedure. In addition to sending each third semester EE student a copy of the pamphlet "A Worthwhile Goal" which explains the purpose and aims of HKN, each eligible candidate is interviewed by a team of several members of the chapter to insure that no trait or accomplishment of the candidate will go by unnoticed. **Following the election of new members, Beta chapter sends notice of the event to the hometown paper of each new brother.**

Two very time-consuming activities of the chapter illustrate its service to the EE department. First, it shares jointly with the local AIEE student branch the responsibility for the planning and organization of the EE department float to be carried in the Senior Day Parade. Secondly, the pledges have as one of their projects the job of making a complete senior picture composite of all the graduating electrical engineering students—no small job because Purdue graduates well over 100 EEs each year. The individual pictures are mounted on a large mat framed and hung on the walls of the Electrical Engineering Building.

Another activity unique to Beta chapter is the making of a scrap book to preserve newspaper articles of pledgings, initiations, elections, banquet programs, and all other inter-

(Please turn to page 16)

esting material pertinent to the chapter's activities. Finally, the chapter's report itself is a beautifully prepared document representing many man hours of work.

2. Delta Chapter at Illinois Institute of Technology, a three time past winner of the plaque and a past recipient of honorable mention, was again voted into the select circle of honorable mentions.

Three activities among the very full activity program of the chapter stand out for their unique value and service. First, the chapter realized that although there was little need for helping the graduating students to obtain satisfactory employment, there was a real need to find summer employment for those who would return to the campus in the fall. Delta chapter met this situation and found summer jobs for all who needed them. Secondly, the chapter continued its tutoring service for freshmen and sophomores. Third, the chapter held a joint initiation with Beta-Tau of Northwestern and the Chicago Alumni chapter. This type of meeting is most valuable in strengthening the bond between the alumni and the college chapters.

3. Omega Chapter at Oklahoma A & M College, a former plaque winner, has completed an excellent year of service and achievement. One of the highlights of the year was the chapter's joint effort with the local chapter of AIEE in their sponsorship of the Regional AIEE Student-Branch Convention held on the campus. Committees for housing, entertainment, correspondence and planning worked hard to make the affair a big success.

Two other projects stand out for their service value. First, the chapter made a substantial donation to a married student who had been the victim of unfortunate circumstances. Secondly, definite planning is underway for the chapter to sponsor a Boy Scout Troop in order to give assistance to the future guidance of the youth in that locality.

4. Beta-Pi Chapter at the City College of New York, a former plaque winner and twice cited for honorable mention since installation in 1946, has once again compiled an enviable record of activity.

The chapter's insurance plan, started in 1949 to pay for breakage or damage by students in laboratory courses, has been so successful that the premium has been cut in half—from $.50 per lab course to $.25 per lab course. While on the subject of finance, it should be noted again this year that Beta-Pi is the only chapter which maintains a non-interest-bearing loan fund for those who prefer to wait until after graduation before paying their initiation and other associated fees. In addition to providing many services for the EE Department, the chapter helped support the City College Alumni Association by selling memberships to the association to some 60% of the Electrical Engineering graduates. Another activity worthy of note here is the publishing of a "Newsletter" which was prepared by the pledges and distributed at the initiation dinner. An explanation of the meaning of HKN membership, timely information about the employment picture for graduates, and other interesting facts were included in this eight-page booklet. Many more activities, too numerous even to mention, rounded out Beta-Pi's very active and successful year.

5. Gamma-Delta Chapter at Worcester Polytechnic Institute, only three years old, has made great progress since its chartering in 1950 and this year's report is indeed commendable. Although most of the chapter's major activities fall within the well known categories of supporting AIEE and IRE programs and providing valuable service to the school's EE department, Gamma-Delta has exemplified the word service in all its undertakings. One activity in particular stands out for both its originality and value. It came as the chapter's answer to the problem of giving the seniors the right preparation for taking interviews, by arranging a series of lectures for the entire class in which several well-qualified speakers took part and answered a great many of the students' questions.

The Jury of Award. This year the jury was composed of five members, three officers from the New York Alumni chapter, the most recent past president of the New York Alumni and one member of the National Executive Council. Those on the jury were: Alton B. Zerby, executive secretary; Edward E. Grazda, past president of New York Alumni Chapter; John H. Craig, President of New York Alumni Chapter; Emerson D. Callahan, Vice-President of New York Alumni Chapter (programs); Edward Schuster, Vice-President of New York Alumni Chapter (membership).

Summary—Once again the members of our college chapters of HKN have shown that they are living up to the honor that has been bestowed upon them. They have rendered service far beyond the call of duty to their schools and EE departments. They have joined with several other professional societies in providing programs of great value to all engineering students, and they have uncovered a host of new ways in which they can serve their school, community and profession.

Eta Kappa Nu is indeed a true symbol of strength, service and accomplishment in our country. That this year's record of achievement may serve as an inspiration to all chapters for going on to even greater heights next year is the jury's hope and prayer.

Winners of N. Y. Alumni Awards

1932-33	Gamma
1933-34	Beta
1934-35	Pi
1935-36	Kappa
1936-37	Omega
1937-38	Epsilon
1938-39	Sigma
1939-40	Delta
1940-41	Beta-Zeta
1941-42	Kappa
1947-48	Delta
1948-49	Delta
1949-50	Beta-Pi
1950-51	Beta
1951-52	Beta-Alpha
1952-53	Beta-Alpha
1953-54	*

* Any chapter, it may be you. It depends only on your performance and the way that it is reported.

Operation Gopher

Texas Engineers Dig Their Own Union

By DONOVAN G. FISCHER, Psi '54

Operation Gopher is a movement on the part of the engineering students at the University of Texas to build for themselves recreational facilities similar to those found at the Student Union but considerably nearer at hand The project takes the form of a 174 x 43 foot basement under the south wing of the Main Engineering Building and is to include a coffee shop, a lounge, a game room, an alumni room and offices for the student professional and honor societies. Once completed, Taylor's T Room will provide a place where engineering students can relax, play ping-pong, shoot pool; or shoot the breeze over a "cuppa coffee."

Names Are Significant

Taylor's T Room and Operation Gopher: these names are significant, making a word or two of explanation in order. When the notion of an engineers' lounge was conceived in the fertile minds of Charlie D. Anderson, Psi '53, and W. Charles Mills, graduate Ch.E. student, it developed simultaneously that the lounge be dedicated to the colorful first dean of the College of Engineering, Thomas Ulvan Taylor; therefore, they called it Taylor's T (for Texas) Room.

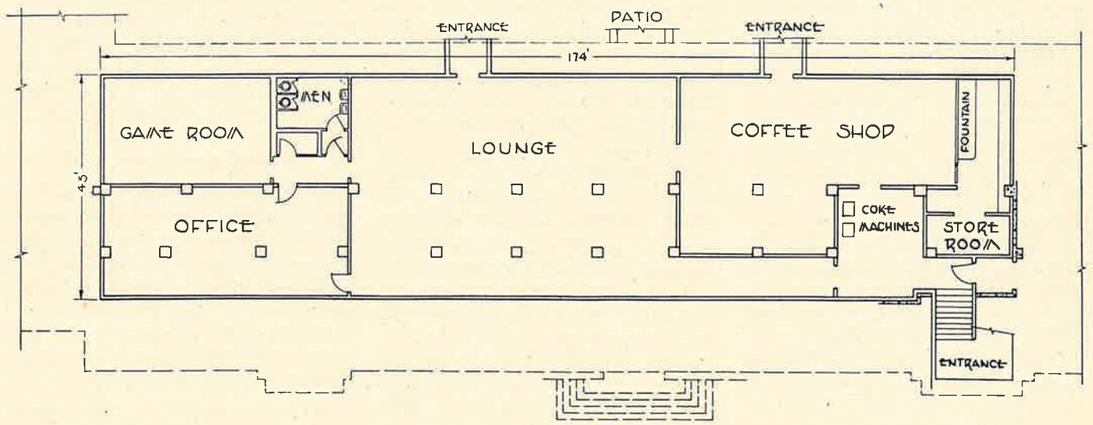
Equipped with a name and much enthusiasm, Messrs. Anderson and Mills set out to convince The University of Texas in general and the College of Engineering in particular of the worthiness of their idea. With untiring efforts and a bit of fast talking here and there, interest was aroused to the point of finding an actual location for the lounge.

One thing led to another; and several locations were rejected until Mr. Carl J. Eckhardt, director of the physical plant, suggested the space beneath the Engineering Building as a possibility. It just happened that the only thing wrong with this space was its present occupancy by much fill and dirt placed there when the Main Engineering Building was constructed. To situate Taylor's T Room there, the framers of the plan observed, would necessitate the removal of some 1800 yards of earth from beneath the building. Could it be done? "Why, shore," they replied optimistically. If so, then how? Who was going to do all the work? "The engineering students will do the work," responded the group of promoters, by this time numbering a full score. "They can dig dirt in their spare time, each digging a little and no one too much. After all, it is an engineers' benefit we are proposing; and the students will be glad to help out." Soon someone observed the analogy between the engineers and a bunch of gophers, both burrowing into the earth, thus effectively initiating the title of "Operation Gopher."

A Separate Union for the Engineers

It has long been a grumbling point among engineers here at Texas that there was no place to gather and chat or relax or drink coffee unless one wanted to journey many blocks to the nearest coffee shop; thus the engineers were virtually anti-social because of lacking facilities of recreation. True, there was always the prospect and practice of gathering in the halls, but standing and talking is somehow not so popular as sitting and talking. Also, the Engineering Library is close at hand, providing a temptation for those who would have a bull-session—and a distinct nuisance for those who wanted to study. In the past few years, the bull-session advocates have won out over the studiers, and the library has been turned into a buzzing speakeasy not at all conducive to getting the job done when one has work urgently waiting.

There is a Student Union at Texas, but it, too, is quite inaccessible from the Engineering College. As a matter of fact, the Union and the Engineering Building could not be much farther apart and both be on the Campus. While the Union is on the western-most side of the



Forty-Acres, the College of Engineering is situated on the extreme eastern side of that same plot of land. It is no little walk to traverse the distance from the engineers' haven to the Union; and if students do not happen to have classes "on the hill" or near the Union, it might as well be in San Antonio for all its usefulness to the engineers.

Taylor's T Room, the end result of Operation Gopher, will remedy the situation by providing a place for lounging, being available at all times and within easy reach of *hard-working engineers*. It will also relieve the congestion of sounds in the Library, leaving it as a library should be.

The Student Engineering Council

Charlie D. Anderson and W. Charles Mills have been mentioned as the originators of this movement. They were not for long alone, however, for they were soon joined by an ardent group of students from every branch of the Engineering College, all working toward the same end. It was recognized almost immediately that the realization of Taylor's T Room would ultimately require more than one or two individuals acting as individuals; it would require an organization which could express a concerted effort equal to the task at hand. With this in mind, the Student Engineering Council was organized. The purposes of the Council were stated as follows:

(1) Correlation and coordination of the member student professional and honor societies.
(2) Promotion of the construction of student recreational facilities in the Engineering Building.
(3) Administration of said facilities.
(4) Furtherance of good will, spirit, and tradition in the College of Engineering.

All of the sixteen members of the Student Engineering Council were not, of course, EEs; but of the four EEs working with the Council at the time of its beginning, three were HKN members. Charlie Anderson, Psi '53, was elected first Chairman of the SEC; Tom E. Fairey, Psi '54, was elected first treasurer of the SEC. There was also Kenneth J. Cox, Psi '53, who was elected the first HKN representative to the Student Engineering Council. In addition to these three, nearly all the remaining members of Psi chapter have aided in the development of the basement by giving much of their time and support whenever they could possibly do so.

THE "KICKOFF" AT SCHOOL OF ENGINEERING, UNIVERSITY OF TEXAS

Dean W. R. Woolrich is second from the right. None of the pictures show him working but yau can bet he did his part.

Getting Under Way

Once the Council was organized, its members began ironing out the many difficulties associated with the construction of Taylor's T Room. The first move was to solicit the able assistance of the faculty. Dean of the College of Engineering, W. R. Woolrich, Theta '11, and naturally a member of Psi chapter, was instrumental and indispensable in setting the wheels of the movement in action. Leonardt Kreisle, Assistant Professor of Mechanical Engineering, and Carl J. Eckhardt, who is Superintendent of the University's utilities, were selected as faculty advisors for the SEC. Many feelers were sent out all over the campus to determine the reaction of others to the movement. The directors of the existing Student Union were consulted, and it was found that they were almost unanimously in favor of an Engineer's Union. The help of the University's daily, *The Daily Texas*, was enlisted for the purposes of presenting the plan to the others of the student body. The University Department of Foods and Housing was consulted in connection with the purchasing and operating of the proposed coffee shop. Here the Council was fortunate because the University requires any campus cafeteria (or coffee shop) to be run by this agency, making it unnecessary for the engineers to furnish attendants. It was necessary for the Council to secure the approval and assistance of the University's Business Manager, the University Development Board, and the Engineering Building Committee, which has the final word on alterations on the engineering buildings. There are three engineering buildings here at Texas! Petroleum Engineering, Chemical and Ceramic Engineering, and the Main Engineering Building for the remaining branches of engineering. Finally, after clearing with the President's Office, the wholehearted support of the Engineering faculty and student body was awarded the Council for their labors, and Operation Gopher was ready for the ground-breaking ceremonies.

The Kickoff

The first shovel of dirt was removed from the basement by Willis Kostka, a freshman engineering student, immediately following kickoff ceremonies at 5:15 PM December 11, 1952. Signifying the newest and oldest Gophers, Willis and E. C. H. Bantel, Assistant Dean Emeritus of the Engineering College, then put the first scoop of dirt into a jar for preservation in Taylor's T Room.

The Engineers' Wives Club

All things considered, the kickoff was a success and Operation Gopher was well under way. As the crowd dispersed, people were furnished refreshments of hot coffee and homemade cookies by the Engineers' Wives Club, an organization for the women which grew out of Operation Gopher, and which helps morale materially by providing coffee and

OPERATION GOPHER—UNIVERSITY OF TEXAS

Note that even the chairman of department of electrical engineering worked. Brother B. N. Gafford is on far right of both pictures.

"sinkers" to the students working in the Gopher Hole.

The Plan of Operation

The removal of 1800 yards of earth from beneath the Main Engineering Building will be done by the students working at night, on weekends and on holidays. Equipped with air-spades, wheelbarrows, shovels and a conveyor belt furnished by Houston contractors, Crutcher-Rolfs-Cummings Company, the engineers may be seen any night plugging away at the Herculean task before them. It seems that when one is faced with moving them, 1800 yards of dirt seem more like 18,000,000!

Upon descending into the Gopher Hole, as it has now been dubbed, one sees the wall of dirt six feet high and forty feet across which must be battled back yet another 140 feet before the finishing operations can begin.

How is the digging handled? The SEC has worked out the following arrangement: each evening and every work period, there is a student assigned to act as overseer for the work. He is called "The Pusher" but has no control over the other students. His purpose is merely to set an example and to provide a bit of initiative and leadership on the scene. Students work in four-hour shifts, alternating between the hard jobs and the not so hard ones. It is estimated that an average of 15 yards a day are being removed from the basement now,* and that this figure will increase considerably when more dirt-moving machinery is procured.

Movement of the dirt goes something like this: one man on the air-spade loosens the dirt that it may be shoveled into wheelbarrows standing nearby. Ordinarily, there are about three shovelers to a wheelbarrow, allowing the wheelbarrow operator little time to be idle. (I myself can testify to the rigors of wheelbarrowing.) The load of dirt is then pushed to the bottom of the opening to the outside where it is dumped into a hopper and quickly lifted outside by a conveyor belt. Once the dirt is outside, it is caught and transferred to a dumping place nearby, where it is loaded on University trucks and hauled off the Campus.

How the Lounge Is to Be Financed

In embarking upon the project, the students realized that no funds could be provided by the University which has so very many demands upon it already. It was believed that this would be the kind of thing graduates would be willing to support. With the students doing an estimated $20,000 worth of work in the excavation, the SEC hopes the University alumni will contribute the $30,000 necessary for the finishing and furnishing, when the digging is completed. Brochures are being sent to all the grads informing them of the project and requesting their assistance. The University has set up a special fund earmarked for Operation Gopher and from which money can be taken for no purpose but Taylor's T Room.

Once the excavation is completed, competent hands will be hired and paid hard money to finish and decorate the inside of Taylor's T Room. In the lounge there will be the usual easy chairs, chess boards, magazines, and newspapers. The offices will include space for the Council, the professional societies, and the honor societies. Each office will have the necessary facilities for filing its records and transacting any necessary business. The coffee shop is to be a soda fountain and a snack bar in the customary manner. Possibly the only great refinement in the whole basement will be the addition of air-conditioning, a benefit denied the rest of the Engineering Building and without which life in the basement would be unbearable come summers.

It is likely that another dozen full moons will rise and fall before engineering students can walk the few short steps to a comfortable, convenient place to relax and take their ease in the odd moments they have away from the serious business of getting an education. But when such time comes, you can bet the University of Texas will have a bunch of happier and better future engineers.*

* May 28, 1953.

* And students and graduates who have learned to work together. The by-product, the formation of a Student Engineering Council, alone will be found invaluable. As this Council is charged with administration of the T Room, it is assured of perpetuity; and when the "big task" is completed you can expect the Council to explore other fertile fields—energetic young men just will not be kept down.

And don't overlook the "Engineers' Wives Club" made up of ladies who seldom see their husbands because of classes, meetings, etc. and when they are at home continuously tell friend wife, "Don't bother me, don't you see I am studying.—THE EDITOR.

Scholarships, Fellowships, Graduate Assistantships, and Teaching Positions Available

Following the policy initiated in 1948, the editor this Fall wrote the heads of the EE departments in which we have chapters and offered to publish announcements of scholarships, fellowships and graduate assistantships that will be available in the Fall of 1954. In the following is listed, alphabetically, information received to date. If others are received, they will be published in the Winter issue.

Polytechnic Institute of Brooklyn
Brooklyn, N. Y.

A. RESEARCH FELLOWSHIPS

Research fellows serve 35 hours per week on a research project leading to the fulfillment of the thesis requirement of the graduate curriculum in which they matriculate, and pursue a full-time program of studies of 10 to 16 hours per week in the Graduate School. A vacation period of three weeks per annum is allowed. Research fellows are required to pay a tuition fee of $350 per semester and are divided into two grades:—

Junior-grade fellows must hold at least a bachelor's degree. The stipend is $2220 per annum.

Senior-grade fellows must hold at least a master's degree or equivalent. The stipend is $2820 per annum.

B. TEACHING FELLOWSHIPS

Teaching fellows are required to serve a total of 15 to 20 hours per week, throughout the academic year of about nine months, in connection with teaching assignments. They are required to enroll as full-time students in the Graduate School, tuition being remitted. Teaching fellowships are classified in three grades:

Grade-3 fellows must hold a Bachelor's degree. The stipend is $900 for the academic year.

Grade-2 fellows must hold a Master's degree or its equivalent. Candidates may qualify also with a Bachelor's degree and one year of satisfactory teaching experience. The stipend is $1100 for the academic year.

Grade-1 fellows must have been admitted formally to candidacy for the doctor's degree. The stipend is $1300 for the academic year.

C. SPECIAL FELLOWSHIPS

There are available a number of fellowships sponsored by industry. Their requirements and stipends vary with the individual sponsor. Information may be obtained from the departmental office concerned or from the office of the Graduate School.

Fellowships are usually awarded on a yearly basis. Renewal is anticipated when desirable and when satisfactory service has been rendered.

Candidates for fellowships should make application on official application forms, available on request, and submit them to the appropriate departmental office at the Polytechnic Institute, listed on the application. Application forms and information may be obtained by writing to the Dean of the Graduate School, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn 2, N. Y.

Carnegie Institute of Technology
Pittsburgh, Pa.

Numerous assistantships and fellowships for graduate study in electrical engineering at Carnegie Institute of Technology are available for the academic year 1954-55. Stipends range from a maximum of $2714 per calendar year for M.S. candidates, and $3790 per calendar year for Ph.D. candidates. In most types of appointments students can carry a substantial full-time academic program completing the M.S. degree in ten months and the Ph.D. in six semesters. Inquiries should be addressed to the Dean of Graduate Studies, College of Engineering and Science, Carnegie Institute of Technology, Pittsburgh 13, Pennsylvania.

INSTRUCTORSHIP IN ELECTRICAL ENGINEERING—The electrical engineering department at Carnegie Institute of Technology expects to have several openings for half-time and full-time instructors in electrical engineering for the academic year 1954-55. Candidates should have completed their M.S. degree and will have an opportunity to work for their Ph.D. Minimum stipends are $1500 plus $680 tuition for half-time and $3000 for full-time instructors on a ten-months' basis with additional amounts in most cases for summer employment on contract research. Inquiries should be addressed to Professor E. M. Williams, Head, Department of Electrical Engineering, Carnegie Institute of Technology, Pittsburgh 13, Pennsylvania.

Cornell University
Ithaca, N. Y.

The School of Electrical Engineering at Cornell University normally has at its disposal each year three graduate fellowships awarded through the University, two fellowships awarded by industry and several industrial scholarships and grants-in-aid.

The value of the fellowships range from an annual stipend of $1100 to one of $2350 from which tuition and fees must be paid. The value of scholarships and grants-in-aid is somewhat less. Graduate students are also eligible for appointment as research assistants in the research program of the school. The projects under investigation in this program are: radio astronomy, radio wave propagation, vacuum tube studies, servomechanisms, and others. Graduate students employed as research assistants are eligible for partial residence credit in connection with their graduate work.

Very frequently positions on the instructing staff of the school are available to graduate students at the instructor level. These appointments are for full-time work on the academic staff and carry with them the possibility of one-half residence credit towards graduate degrees.

Further information concerning these matters may be obtained by corresponding with Dr. A. B. Credle, Franklin Hall, Cornell University, Ithaca, New York.

Georgia Institute of Technology
Atlanta, Ga.

GRADUATE ASSISTANTSHIPS, SCHOLARSHIPS, FELLOWSHIPS—Several graduate research assistantships, graduate assistantships, part-time instructorships, graduate fellowships and research fellowships are available. A brief description of each is contained in the Graduate Division Bulletin, a copy of which can be obtained from Ray L. Sweigert, Dean of Graduate Division, Georgia Institute of Technology, Atlanta, Ga.

TEACHING POSITIONS OPEN—Two additional faculty members are needed next Fall starting September 1, 1954. One of these should have a doctorate with major interest in radio engineering; the other should have a doctorate with major interest in power. The faculty rank will be that of Associate Professor and the salary is open to negotiation. It is possible that these can spend part time in research at the State Engineering Experiment Station and part in the department, if they desire. Write Prof. E. R. Weston, acting director, School of Electrical Engineering, Georgia Institute of Technology, Atlanta, Georgia.

University of Kansas
Lawrence, Kans.

GRADUATE ASSISTANTSHIPS—In the Fall of 1954 several graduate assistantships will be open in the department of electrical engineering. These assistantships pay $1200 per academic year for half-time service to the University while the recipient is working toward the M.S. or Ph.D. degree.

FULL TIME TEACHING POSITIONS—In the Fall of 1954 the electrical engineering department will have at least one full-time teaching position open. Salary and rank will depend upon applicant's qualifications.

For further information address Dr. William P. Smith, Acting Chairman, Electrical Engineering Department, University of Kansas, Lawrence, Kansas.

Massachusetts Institute of Technology
Cambridge 39, Mass.

In 1954 MIT will offer approximately 60 graduate assistantships. These assistantships will provide an opportunity for participation in one of a number of sponsored research laboratories under this department's or inter-departmental control, as well as participation in the teaching program of the department according to the applicants' particular interests.

The appointments are full-time staff positions. Assistants are permitted to carry about 40% of a full-time academic load. Salaries range from a minimum of $210 per month together with certain staff scholarships. Industrial fellowships are also available. Their value ranges between $1,000 and $2,700 per year, with an average value of $1,200 plus full tuition.

Requests for new MIT graduate study announcement, further information, application blanks, etc., should be made to Professor Gordon S. Brown, Head, Department of Electrical Engineering, MIT, Cambridge 39, Mass.

University of Michigan
Ann Arbor, Mich.

In 1954 opportunities will be available for graduate students in both teaching and research. Several teaching assistantships are open to graduate students in the machinery-power and in the electronics-communication laboratories of the electrical engineering department. In addition, employment opportunities exist in research laboratories associated with the department.

A variety of fellowships is also available to those planning a program of full time graduate study.

Requests for further information may be addressed to the Chairman, Electrical Engineering Department, University of Michigan, Ann Arbor, Michigan.

The University of Nebraska
Lincoln 8, Nebr.

INSTRUCTOR OR ASSISTANT PROFESSOR OF ELECTRICAL ENGINEERING—Prefer one with interest in power. At least M.Sc. desired, or possibility of obtaining same soon. Position available immediately, or February 1st. Salary depends upon experience.

Send application to Chairman, Department of Electrical Engineering, University of Nebraska, Lincoln, Nebraska.

The City College of New York
New York 31, N. Y.

The City College of New York has salary schedules similar in form to Civil Service schedules, which are fixed by New York State law:

Rank	Minimum	Maximum
Tutor	$3150.	$3950.
Instructor	$3698.	$6500.
Assistant Professor	$4550.	$7600.
Associate Professor	$6050.	$9000.
Professor	$7550.	$9500.
Lecturer	$3550.	$7550.

The Ph.D. degree or the professional engineer's license in New York State is ordinarily required for initial appointment or promotion to all ranks except Lecturer and Tutor. Applicants for teaching positions who come from outside the state, may substitute equivalent qualifications for acceptance while full qualification is being established or they may be appointed in the temporary ranks of Tutor or Lecturer.

Original appointments are temporary, and are for one year or less. After three successive annual appointments in any of the above ranks, except those of Tutor and Lecturer, a fourth appointment carries tenure, which guarantees a lifetime position during good conduct, and provided enrollments warrant. In the rank of Tutor, the teacher must qualify for promotion within five years or leave.

New York University
University Heights, New York 53, N. Y.

THE WESTINGHOUSE FELLOWSHIP, supported by the Westinghouse Educational Foundation, carries a stipend of $2000 per year. The student receives $1200, and the remaining $800 is used to defray the cost of tuition and appropriate fees.

THE DAVID SARNOFF FELLOWSHIP, established by the Radio Corporation of America, carries a grant of $2700 per year. Of this the student receives $1600-$1900, depending upon his qualifications. The remainder is allocated to tuition fees and the support of the Fellowship program.

GRADUATE ASSISTANTSHIPS—For men who are interested in devoting approximately one half of their time to graduate study, graduate assistantships are available. These positions require the student to spend approximately twenty hours per week assisting in laboratory courses, and carry a stipend of $1400 for the first year of residence and $1600 for the second year. In addition to these amounts, graduate assistantships have tuition remission privileges for three full courses for each 9-month academic year. Usually, there are opportunities for summer employment on departmentally conducted research projects for men employed as graduate assistants during the 9-month academic year.

A modification of this graduate assistant program has also been initiated to permit individuals to obtain a Master degree in one calendar year. Individuals accepted for this program begin their combined work and study program immediately following graduation in June. They serve as members of a research team during the summer months and as graduate assistants during the ensuing 9-month academic year. Students in this program receive up to $1000 for their summer employment.

For those men who wish to complete the requirements for a higher degree at a considerably slower rate, opportunities are available for full-time (35-hour week) employment on research projects associated with the department of electrical engineering. Tuition remission privileges not to exceed three courses per term are accorded these appointees.

Inquiries concerning work in the electrical engineering department should be directed to the Chairman, Dr. J. H. Mulligan, Jr., at University Heights, New York 53, N. Y. General information regarding the Graduate Division and requirements for admission should be directed to Dr. H. J. Masson, Assistant Dean in charge of the Graduate Division, University Heights, New York 53, N. Y.

Northwestern University
Evanston, Ill.

Financial aid is available to graduate students in the department of electrical engineering at Northwestern Technological Institute in the form of assistantships, fellowships and scholarships.

Stipends for assistantships are usually $133 a month plus tuition and may involve either teaching or research duties. Continuing research projects within the department relate to communication, electronic-tube design, circuits, power-system analysis, high-voltage phenomena, microwaves, analogue computation, and electric control. Assistants are permitted to carry three-quarters of the normal full-time graduate study.

Aid in the form of fellowships and scholarships varies in amount, depending upon academic record and need.

Requests for additional information and application blanks should be addressed to: Chairman, Department of Electrical Engineering, Northwestern University, Evanston, Illinois.

The University of Pennsylvania
Philadelphia, Pa.

The Moore School of Electrical Engineering, University of Pennsylvania,

offers opportunities for graduate study and research; programs involving either full-time graduate work, or part-time research and part-time graduate study are available.

Two $2,250 graduate fellowships are offered to qualified students for the academic year 1954-55. Fellowship holders register for a full program of study leading to advanced degrees.

Positions are also available in the Moore School Research Division to applicants with suitable backgrounds in the fields of electrical engineering, mathematics, and physics. Appointments are on either full- or part-time basis, with opportunities for advanced study in any department of the University. Research work is currently being conducted in the following fields: digital and analogue computers, microwaves, communication theory, and electromedicine.

Applications should be addressed to S. Ried Warren, Jr., Vice Dean, Moore School of Electrical Engineering, 200 South 33d Street, Philadelphia 4, Pennsylvania.

Purdue University
West Lafayette, Ind.

The School of Electrical Engineering, Purdue University, will have available a number of graduate assistantships and certain scholarships and fellowships for the school year 1954-55. Graduate teaching assistantships and graduate research assistantships which do not result in a thesis for the student will be available, the stipend being $1500.00 for the academic year of two semesters. These stipends are paid on a monthly basis. The holders of these assistantships are exempt from tuition and all University fees except $30.00 per semester. If a thesis problem is connected with the assistantship, the assistantship stipend is $100.00 per month with tuition and fees exemptions as above.

There are a few scholarships for $500.00 per year with tuition exemption and no staff duties. They are available only to very outstanding students who plan to carry their program through to the doctorate degree.

INDUSTRIAL SCHOLARSHIPS—The following fellowships will also be available: International Business Machine Corporation, Westinghouse Electric Corporation, and the Duncan Electric Manufacturing Company. These fellowship awards range from $1200.00 to $2500.00 per year. In most cases part of the award is used for tuition and fees, and in some cases for certain supplies in connection with the student's research program.

Applicants for assistantships, scholarships, and fellowships must be graduates from accredited colleges with class standings in the upper quarter of their class. Address Dr. D. D. Ewing, Head, School of Electrical Engineering, Electrical Building, Purdue University, West Lafayette, Ind.

Rutgers University
New Brunswick, N. J.

Teaching Assistantships, Research Assistantships, and Research Fellowships are available in the Rutgers College of Engineering. These awards usually provide a stipend of $1,200 for the academic year. It frequently is possible to continue holders of such awards through the summer months on a full-time basis.

Scholarships without stipends are open to students in all branches of graduate engineering. These scholarships provide for free tuition, but do not carry an additional monetary award.

Students in all of the above categories are exempt from tuition, but are required to pay an admission fee of $10 payable once, a registration fee of $5 per semester, and a diploma fee upon completion of the requirements for an advanced degree.

Applications for assistantships and fellowships should be made to the Dean of the College of Engineering, Rutgers University, New Brunswick, New Jersey. Information regarding scholarships without stipends may be obtained from the Dean of the Graduate School. All applications should be filed before March 1.

The University of Tennessee
Knoxville, Tenn.

POSITIONS OPEN AT THE UNIVERSITY OF TENNESSEE—Two research positions are open at the University of Tennessee for electrical engineering graduates who have specialized in communications and electronics. The work of one is in the field of radiation and propagation, both theoretical work and test work in the field; in the other, in the field of specialized electronic circuitry. Applicants should be citizens of the United States and should be interested in taking graduate work in electrical engineering. Starting salary $3900-$4500.

A teaching and research staff position is open at the University of Tennessee with the title of Associate Professor of Electrical Engineering. Applicants should have the Ph.D. (or equivalent) degree in Electrical Engineering specializing in communications work and should have some teaching experience. Salary $8,000-$9,000. Write to: Professor Paul C. Cromwell, Electrical Engineering Department, University of Tennessee, Knoxville 16, Tennessee.

Agricultural and Mechanical College of Texas
College Station, Tex.

FELLOWSHIPS—The Electrical Engineering Department will have two fellowships which will be open in September of 1954. They should be attractive to any B.S. in E.E. who is interested in working for his M.S. or Ph.D. degrees. Both of these fellowships carry a stipend of $1200.00 payable in ten installments. One of these fellowships is known as the Texas Power and Light Company Fellowship, and the other the Westinghouse Fellowship on Power System Studies. Apply to Prof. M. C. Hughes, Head, department of electrical engineering, A & M College of Texas, College Station, Texas.

GRADUATE ASSISTANTSHIPS — The department will have openings for two graduate assistants with a stipend of $110.00 per month. Individuals interested in this should reply directly to Dr. Ide P. Trotter, Dean of the Graduate School, Texas A&M College.

University of Wisconsin
Madison, Wisc.

FELLOWSHIPS—The following fellowships are open to graduates of recognized universities and colleges for graduate study in electrical engineering: Edward Bennett Memorial—$1000; Westinghouse Educational Foundation—$1200; University of Wisconsin (one to four available)—$1150-$1500.

These fellowships permit full-time graduate study, and do not require service on the part of the student.

ASSISTANTS — The following assistantships are open to graduates of recognized universities and colleges:

Research Assistantships (one to six available) academic year $1150; Calendar year—$1380.

Part-time Instructorships (four to eight available; academic year)—$1800 half-time; $1200 one-third time.

The research assistantships require half-time service to the university, but the student can carry a full program of graduate study.

The half-time instructorships require half-time service to the university and permit approximately two-thirds of a normal program of graduate study. The one-third time instructorships require one-third time service to the university and permit a full program of graduate study.

Out of state tuition fees totalling $300 per academic year are waived for these appointments.

Application must be received before February 15, 1954. For further information address Chairman, Department of Electrical Engineering, University of Wisconsin, Madison, Wisconsin.

Life-Subscribers

To date of publication of this issue, we have 556 life-subscribers; they continue to come in. Does your copy of this issue contain a slip before page 1, notifying you that your subscription has expired? Why not make your renewal a LIFE-SUBSCRIPTION?

Perhaps your subscription has some time before it expires. Provision has been made to give members like you credit on your unexpired term. From time to time, new members with four (five if immediately after initiation) years of unexpired subscription have converted the "credit" into life-subscription. For information specific to your situation, write the editor.

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No. 450—LIONEL ROBBINS, K '49, engr., Perkins-Elmer Corp., Norwalk, Conn. (res) 321 Warburton Ave., Yonkers 2, N. Y.

No. 451—BERNARD M. BRENNER, D '48, develop. engr., Askania Regulator Co., Chicago 11, Ill. (res) 2101 Downey Rd., Homewood, Ill.

No. 452—FLOYD FULLWILER, Mu '49, elec. engr., Engr. Research Assn., St. Paul 4, Minn. (res) 1952 Marshall Ave., St. Paul 2, Minn.

No. 453—THEODORE SHAPIN, JR., D. '48, res. assoc., Digital Computer, Univ. of Illinois, Urbana, Ill. (res) 4006 N. Sheridan Rd., Chicago 13, Ill.

No. 454—DONALD S. BANKUS, B-Tau '48, elec. engr., Ratheon Mfg. Co., Wellesley Hills, Mass. (res) 20 Maple Rd., Wellesley Hills, Mass.

No. 455—JOHN R. MITCHELL, B-U '48, div. elec. foreman, Illinois Central RR Co., Clinton, Ill. (res) 520 W. Main St., Clinton, Ill.

No. 456—WILLIAM G. HESSLER, JR., B '46, electronic engr., US Army Signal Corps., 8084 AU, Det. B., A. P. O. 503, c/o Postmaster, San Francisco, Calif.

No. 457—MAURICE K. CARR, A '39, chief product engineer, Argus Cameras Inc., Ann Arbor, Mich. (res) 104 S. Revena, Ann Arbor, Mich. (Son of Maurice L. Carr, Founder of HKN.)

No. 458—WAYNE H. ULMAN, G '49, elec. engr. Monarch Machine Tool Co., Sidney, Ohio. (res) RFD No. 6, Sidney, Ohio.

No. 459—JESSE E. HOBSON, B '32, HKN Recognition 1940, National Vice-President, HKN. Director, Stanford Research Institute, Stanford, Calif.

No. 460—DONALD E. OBERG, K '48, (res) 7 Briarwood Lane, Greenhills, Cincinnati 18, Ohio.

No. 461—LT. CARLYLE W. FAY, Th '47, USS Tusk, c/o F. P. O. New York, N. Y.

No. 462—STANLEY H. KLUG, B-Pi '48, engr., Airborne Instrument Lab., 160 Old Country Rd., Mineola, L. I., N. Y. (res) 55 Hanson Place, Brooklyn 17, N. Y.

No. 463—C. G. SUITS, B-Nu '47P, HKN Recognition 1937, Vice-President in charge of Research, General Electric Co., Schenectady, N. Y. (res) 1317 Regent St., Schenectady, N. Y.

No. 464—HAROLD R. DELANEY, I '48, (res) 8944 Cardinal Terrace, St. Louis 17, Mo.

No. 465—HENRY M. FEDERLIN, Tau '49, electronic engr., National Cash Register Co., Dayton 9, Ohio. (res) 4116 Brenton Drive, Dayton 6, Ohio.

No. 466—DONALD K. MYERS, B-K '43, (res) 9943 Edmil Lane, Overland 14, Mo.

No. 467—HERBERT W. POLLACK, B-Pi '50, res. associate, NYU Research Div., Sage Bldg., New York 53, N. Y. (res) 300 Lenox Rd., Brooklyn 26, N. Y.

No. 468—PAUL T. HAHN, G '31, executive engr., Gaylord Products, Inc., 1918 Prairie Ave., Chicago 16, Ill. (res) Bateman Rd., R. D. No. 3, Box 248, Barrington, Ill.

No. 469—E. R. RATHBUN, JR., Nu '48, dir. physical res., Radiation Counter Labs., 5122 W. Grove St., Skokie, Ill. (res) 355 E. Whitehall, Northlake, Ill.

No. 470—ELBERT W. TRANTOW, Th '49, res. engr., Hughes Aircraft Co., Culver City, Calif. (res) 7033 Kittyhawk Ave., Los Angeles 45, Calif.

No. 471—RICHARD M. DONNELL, B '48, (res) 1416 N. Harrison Ave., Fort Wayne 7, Indiana.

No. 472—JEROME G. HANDELSMAN, B-Pi '49, prod. engr., Transicoil Corp., 107 Grand St., New York, N. Y. (res) 410 Central Park West, New York 25, N. Y.

No. 473—KENNETH W. RAU, G '49, electronic engr., Sylvania Electric Products Co., 70 Forsythe St., Boston, Mass. (res) 55 Wood St., Lexington, Mass.

No. 474—J. M. WALLACE, B-D '48P, div. mgr., Meter Div., Westinghouse Electric Corp., 95 Orange St., Newark, N. J. (res) 5 Glenside Terrace, Montclair, N. Y.

No. 475—MIHRAN LEVON, JR., Mu '49, field service engr., Servomechanisms, Inc., Post & Stewart Ave., Westbury, L. I., New York. (res) 4308 S. Western Ave., Los Angeles 62, Calif.

No. 476—SIEGFRIED E. MANECKE, B-D '48, (res) 203 Saxton Rd., Mansfield, Ohio.

No. 477—ROBERT LOWELL, B-Z '48, Bell Telephone Laboratories, Whippany, N. J.

No. 478—JOSEPH F. ALBIN, Boeing Airplane Co., Dept. 318, Electronics, c/o Mike Welsch, Seattle 14, Wash. (res) 10703 Cayuga Drive, Niagara Falls, N. Y.

No. 479—HERBERT D. GROSVENOR, B-Omic '46, (res) 1332 Maple Ave., Fort Wayne 6, Ind.

No. 480—ROBERT R. GRIFFITH, B-Rho '49, elec. engr., Appalachian Electric Power, Beckley, W. Va. (res) Cool Ridge, W. Va.

No. 481—OSCAR FRIEDMAN, B-Pi '48P, asst. chief engr., Panoramic Radio Products, Mt. Vernon, N. Y. (res) 495 E. 178th St., New York 57, N. Y.

No. 482—MYRON LEEDS, B-Pi '50, proj. engr., Carol Electronics Corp., 141 E. 25th St., New York 10, N. Y. (res) 105-05 69th Ave., Forest Hills 75, N. Y.

No. 483—HAROLD L. NEWMAN, D '49, engr., U. S. Navy Electronics Lab., San Diego 52, Calif. (res) 2133 Clematis St., San Diego 5, Calif.

No. 484—DAVID L. SMITH, B-Mu '50, (res) Box 237, Woodroffe P. O., Ottawa, Ontario, Canada.

No. 485—OWEN L. WILLIAMS, B-Nu '49, member of technical staff, Bell Telephone Labs., Murray Hill, N. J. (res) 172 N. Hillside Ave., Chatham, N. J.

No. 486—ELMER E. BARTHEL, S '52, field engr., General Electric Co., 535 Smithfield St., Pittsburgh 22, Pa. (res) 4590 Cherryland St., Pittsburgh 14, Pa.

No. 487—ALI AMERIGO FIORLETTA, B-Pi '49, engr., W. L. Maxson Corp., 460 West 34th St., New York, N. Y. (res) 1868 Bronxdale Ave., New York 62, N. Y.

CHAPTER LETTERS

ALPHA CHAPTER
(University of Illinois)
By Robert N. DuFore

The officers of Alpha chapter for the Fall semester 1953 are as follows: Ruel Weas, president; Porter J. Womeldorff, vice-president; Edward L. Conover, secretary; Samuel B. Balden, treasurer; Robert H. Hardin, corresponding secretary; and Robert N. DuFore, BRIDGE Correspondent. There are twenty active members who have returned to the campus this Fall.

Outstanding students in electrical engineering were honored by Alpha chapter at a smoker and coffee hour October 27.

The program of entertainment was very interesting with Professor McLachlan playing the piano and a liar's contest between the faculty and students being the highlights.

Pledge week is underway with twenty new men being considered for membership. The induction banquet is planned for December 9, 1953 with the Dean of the College of Engineering, W. L. Everitt, acting as toastmaster.

Planning is underway for the celebration of the 50th anniversary of Eta Kappa Nu in 1954. Several committees have been formed which are composed of both faculty and student members. Among these are the Housing Committee, Banquet and Luncheon Committee, Program Committee, and the Plaque and Stone Committee.

EPSILON CHAPTER
(Pennsylvania State College)
By Richard R. Oswald

The members of Epsilon chapter had an opportunity to look over twenty prospective pledges at a smoker held November 12. After short talks by the faculty adviser, Prof. C. B. Holt, Jr., and the chapter president, John Landis, refreshments were served. Voting on the pledges was conducted at a meeting immediately after the smoker. Three pledge meetings are planned, with the induction and a banquet scheduled for sometime in December.

There are eleven members of Epsilon chapter back this year. The enrollment of EE's here at Penn State totals 608, with a breakdown as follows: Freshmen, 276; Sophomores, 161; Juniors, 110, and Seniors, 61.

THETA CHAPTER
(University of Wisconsin)
By John Scharf

Theta chapter held its spring initiation banquet May 7, at which time eight new members were initiated. The addition of these eight new members brought the total membership of Theta chapter to twenty. However, nine of the brothers graduated in June so that Theta chapter had eleven members that returned to school this fall.

At the first fall meeting, it was decided to work on several chapter projects this year: (1) Colored slides of typical activities in the day of an electrical engineer at the University of Wisconsin to be used in counseling high school seniors, and (2) a curriculum evaluation plan utilizing a suggestion box to be placed in the lobby of the EE building. Several other projects were discussed, but set aside for future action.

The election of new members was discussed, and it was found that more than 20 students were eligible. Plans were made to get as many eligible students as possible to join. These plans, the members believe, will result in an active and productive year for Theta chapter.

The number of students in each class in Electrical Engineering at the University of Wisconsin is as follows: Freshman, 324; Sophomore, 132; Junior, 74; Senior, 67.

IOTA CHAPTER
(University of Missouri)
By Hugh E. Kessinger

Iota chapter is now conducting its semi-annual slide rule class. About forty students in the different branches of engineering, chemistry and physics are enrolled in the four classes. All basic and special scales on the rule are taught by the undergraduate members of the chapter.

The smoker for prospective members was held Thursday, October 22. The six prospective members were introduced to the active members of the chapter, and the faculty. Professor C. M. Wallis, head of the electrical engineering department, gave a talk on the history of Eta Kappa Nu, and explained the purposes of the organization. Coffee and donuts were served and the meeting closed with an informal discussion of the electrical engineering curriculum. The men invited to the smoker were invited to join the chapter and those that accepted have begun their pledge duties. These men are Harold D. Busby, Hal V. Miller, Roger L. Mell, Charles F. Kircher, Geo. Chambers, all juniors.

Iota chapter was host to the national president of Eta Kappa Nu, Dr. Eric T. B. Gross, Friday, November 6. The afternoon was spent touring the electrical engineering department and meeting the faculty. There was a meeting with the chapter officers followed by a dinner at which Dr. Gross was the chapters guest.

KAPPA CHAPTER
(Cornell University)
By John R. Arnold

We are sponsoring a tutoring program in basic electrical engineering subjects. Individual aid will be available to all undergraduate electrical engineers who are taking basic subjects.

ALPHA CHAPTER OCTOBER 1953

Top Row Left to Right: Frank J. Sekara, John H. Strathman, Charles J. Kersch, James R. Peterson, George Kerster, Donald H. Nash, Milton E. Radant, Richard O. Bez. Middle Row: Robert H. Hardin, corresponding secretary; Samuel B. Balden, treasurer; Porter J. Womeldorff, vice-president; Ruel V. Weas, president; Professor Paul K. Hudson, faculty advisor; Edward L. Conover, secretary; Robert N. DuFore, BRIDGE correspondent.

Bottom Row: George Q. Lofgren, Eldon E. Ash, Alan J. Padorr, John L. Overbey, James G. Roth.

Not in picture: Dean D. Hickman.

Since Cornell has compulsory five year programs, we intend to help EE undergraduates select their liberal arts electives and many semi-technical courses in business, for example. Most of the chapter members have already taken university courses in other schools at Cornell and can tell of their experiences in the Art school at an open bull session.

Our chapter is also trying to pave the way for an honor system in the EE school.

We have seven members back from last year. Our EE school enrollment by classes is as follows: Frosh, 92; Soph, 79; Junior, 49; 4th year, 48: 5th year, 41.

LAMBDA CHAPTER
(University of Pennsylvania)
By S. Fisher

With the beginning of the fall term at the Moore School of Electrical Engineering, all undergraduate members of Lambda chapter returned, and the chapter started off by sponsoring its annual freshman orientation program.

October 23, interviews were held with those juniors and seniors who were scholastically eligible for induction into the Society. As a result, the following juniors were elected to the chapter: R. Armstrong, J. Bordogna, D. DiGiovacchino, and L. Rubin. Also elected were three seniors: L. Allen, S. Bazan, and R. Shakeshaft. These men will be inducted very shortly, although the date has not been set as of the time of this writing.

The present officers of Lambda chapter are A. Messey, president; W. Blumenstein, vice-president; J. Wolff, recording secretary; W. Eichwald, corresponding secretary; A. Gudjohnsen, treasurer; and S. Fisher, BRIDGE correspondent.

Lambda chapter plans in the near future to resume its slide-rule exams and courses, and to continue its policy of "importing" speakers to talk on non-technical subjects to interested Moore students. At this time it appears that Lambda chapter has an enjoyable and active year to which to look forward.

PI CHAPTER
(Oregon State College)
By Stephen Young, '53
and Stanley V. Marshall, '54

Among the activities that the Pi chapter participated in last Spring term were framing the pictures of the graduating electrical engineers and acting as guides for the high-school students during Senior Weekend. The Outstanding Sophomore Electrical Engineer, Frank Olson, was honored by HKN at an AIEE banquet held jointly by the student section at OSC and the Portland section.

PI CHAPTER JUNE 1953

Left to right: E. Bauder, J. Young, L. Marsters, F. Terrill, L. Jensen, F. Tinker, S. Marshall, S. Young, L. Robinson, E. Andrews, R. Clark.

The four men initiated into the society the Spring term were Joe Stover, graduate student; Christian Bachman; Don Chambers and George Hume, all '53.

The officers elected for the coming year were George Hume, President; Donald Chambers, Vice-President; Gene Andrews, Treasurer; Ronald Clark, Recording Secretary; Leland Jensen, Corresponding Secretary; and Stanley Marshall, Bridge Correspondent.

Pi Chapter regrets to announce the loss of Prof. Ben H. Nichols, Pi '19, who recently passed away. Prof. Nichols was active in HKN as well as the other organization in which he belonged; these included Sigma Tau, AIEE, Masons, Society of American Military Engineers, Reserve Officers Association, and American Society of Engineering Education.

Among the "old timers" retiring this year is Prof. Samuel H. Graf, Pi '07.

The returning members of Pi chapter this fall include the six officers and one graduate student. First meeting of the year was held October 21 to discuss candidates for new membership. A decision was reached to extend invitations to three seniors, with the discussion of the remaining candidates being deferred until the next chapter meeting.

Enrollment in EE for the fall term is as follows: Seniors, 34; Juniors, 31; and Sophomores, 46. This enrollment is comparable in number to that of last year.

Plans also were discussed for an HKN-sponsored technical-book auction to raise funds for this years project. This plan has been resorted to in the past with moderate success.

RHO CHAPTER
(University of Colorado)
By George N. Halpin

We have 36 seniors and 50 juniors returning to the electricals this semester. From this number, invitations to join HKN were mailed to 3 seniors, 9 juniors, and 3 faculty members. All 15 were present at the pledge meeting which was held Wednesday, November 4th. Initiation of new members is tentatively planned for January 10th.

Rho chapter is looking into the possibility of obtaining and furnishing a student lounge in the EE department.

Out of 33 honor societies on the University of Colorado campus, HKN is fifth scholastically with an average of 3.372.

SIGMA CHAPTER
(Carnegie Institute of Technology)
By John R. McNaugher

At the present time our active membership is down to ten men but, we recently have pledged an additional ten who will be inducted at a banquet December 9. These ten pledges are: E. M. Davis, P. K. Eckman, R. W. Goodell, D. Horelick, J. A. McCarthy, J. McKissick, J. D. Meindl, W. H. Moore, W. L. Shevel and W. W. Sick.

Under the leadership of President Eicheldinger, Sigma chapter is engaging in a number of activities. Among these are: A Faculty Liaison Committee, a rejuvenation of the Electrical Engineering Department Newspaper, *The Large Charge*, and assistance to the Department in preparing for an Open House to be held November 5. In addition, the pledge projects will be directed toward improving the laboratory facilities.

UPSILON CHAPTER
(University of Southern California)
By Charles Zauft

The T.V. show "Halls of Science" on the March 1st broadcast over KNBH at 3:30 was conducted by Prof. Renolds, HKN advisor, and Prof. Baddorf. They

were assisted by HKN members of Upsilon chapter. The show gave both demonstrations and talks on electricity and electronics for the people in Southern California. Lester Winslow, recording secretary of our chapter, constructed the Telsa Coil used in one of the demonstrations.

HKN members often build laboratory equipment to extend present laboratory facilities. Robert Rudich has been particularly active in the development of new bread boards for the electronics laboratory. Clarence Peterson is building a D.C. amplifier for the servo-mechanisms laboratory.

The formal induction and banquet was held May 8th at Scully's restaurant in Los Angeles. Dr. Dean E. Wooldridge, Vice-President of Research and Development at Hughes Aircraft Company, was inducted as a professional member and gave a talk on "The Difference Between The Scientist and Engineer" at the banquet. John Pulskamp, an engineer employed by the department of Water and Power and a graduate student here, was also inducted.

The undergraduate pledges inducted were: James Moulton, Franz Worth, Gerald Evans, Carl Zink, Paul Burks, Herbert Elkin, Paul Romandia, Robert Thompson, Fran J. Wunderlich, Robert A. Clanton, John Morton, Theodore Casad, and Wilmont Hunter.

CHI CHAPTER
(Lehigh University)
By Robert V. Vekony

Chi chapter started the fall semester with only seven active members. Because of the relatively high scholastic requirements and the devastating grades of last year, many otherwise able men could not be pledged.

This fall's tapping ceremonies will take place late in November, and the new pledges will be inducted sometime during the second week in December.

The program for our chapter this year will be a vigorous one. Besides getting to work on some project for the benefit of the EE department, we plan to schedule some guest speakers, possibly in conjunction with the AIEE. Summer employment proved very interesting for many of the brothers, and we hope to have time for a few lectures concerning the projects with which they worked.

PSI CHAPTER
(University of Texas)
By Ben F. Johnson

Psi chapter began the Spring semester by inducting a new pledge class consisting of Glenn Deakins, William Foote, S. E. Hockaday of Texas Electric Service Company, Ben F. Johnson, Walter Phillips, William Weigler, and Everett Wilson. After the formal induction ceremony, a picnic was held at the lake home of Professor B. N. Gafford, EE department chairman.

Officers for the summer and fall semesters of 1953 are: Donovan G. Fischer, president; Glenn Deakins, vice-president; A. W. Ivy, treasurer; Bob I. Vancil, corresponding secretary; and Ben F. Johnson, Bridge correspondent.

Charles Dale Anderson, Psi, '53, was awarded a plaque honoring him as the outstanding electrical engineering student of 1953. This was a result of Charlie's enthusiasm and work in organizing the Student Engineering Council and in launching "Operation Gopher" (see page 17).

Psi chapter's main activity has been cooperating with the other engineering honor and professional societies in working on "Operation Gopher." It has been estimated that excavation work will be completed by February and construction should begin shortly thereafter.

At the suggestion of Brother Zerby, a committee was set up to investigate keeping of files of The Bridge in the Engineering library and also take steps to increase circulation of The Bridge in this area.

OMEGA CHAPTER
(Oklahoma Institute of Technology)
By Burt Gambill, Jr.

Omega chapter began its fall activities with the following officers in charge: Richard Pittenger, President; Robert Lee, Vice-president; Robert E. Cloon, Treasurer; David Wells, Secretary; Branson Crockett, Student Council Representative; Burt Gambill, Jr., Bridge Correspondent; and D. L. Johnson, Faculty Advisor.

The major event of this semester has been the pledge week. Five new initiates became members. The new members are: William Harts, Lawrence Jelsma, Max D. Holley, Martin E. Fate, Jr., and Joe Bob Flowers.

Omega chapter has felt that positive action should be taken toward promoting interest in Eta Kappa Nu. Consequently, a joint AIEE-IRE HKN meeting was held. The freshmen and sophomores in attendance were told briefly about requirements for becoming a member of Eta Kappa Nu, and were urged to try to attain these requirements.

Many notable attainments were made by the Electrical Engineering School in general and by HKN in particular during the previous year. The EE school placed second in the annual Engineering Exposition. Five research contracts have been granted the EE school, which now spends seventy-four percent of its total budget on research. Graduate work has been on the upgrade in EE. In 1953, twenty-nine percent of the degrees granted will be Master's degrees. Brother A. W. McMurtrey, Beta-XI '44, will receive the first Ph. D. from A. & M. College with a major in EE. Harold Fristoe, Omega 42-P, and A. L. Betts, Omega 48-P, recently received their Ph. D.'s from Texas A. & M. College and Texas University, respectively. Both men have been promoted to the position of full professor. Calvin Vogt, recently graduated member of Omega chapter, was elected the outstanding all-around EE senior for the past year.

BETA-ALPHA CHAPTER
(Drexel Institute of Technology)
By Adolph K. Rapp

Beta-Alpha started the term under its new officers with 14 members. Five business meetings were held by November 7th. One of these meetings was a smoker at which prospective pledges were interviewed. As a result, seven men were elected. These men, all of whom are juniors, are John Bisage, Charles Der, Maximilian Krapf, Ralph Parris, Charles Pendered, Robert Schweitzer, Gerold Stackhouse.

Each of these men has been assigned the task of writing a paper which is suitable for submission to the AIEE Prize Paper Contest. The best one of these papers will be submitted.

The group pledge project which these men will undertake is the construction of a shield box similar to the one built by the Beta-Pi chapter.

An HKN slide-rule class was started and is being conducted by Godfrey (no longer Gottfried since he received his Citizenship) Buss.

In joint sponsorship with the Student Branch of the AIEE, Beta-Alpha conducted a tour of the Drexel laboratories for the new freshmen, organized an outing for all EE's at Drexel's Lodge, and started rebuilding the equipment at the 'ham shack.'

All the members are now looking forward to the presentation of the second consecutive New York Alumni Achievement Award.

BETA-BETA CHAPTER
(Brooklyn Polytechnic Institute)
By Bruce H. Swenson

The first order of business at BPI for the six returning members was the elections, at which eighteen pledges were chosen for induction.

The annual smoker which HKN sponsors jointly with the AIEE will be the highlight of the fall term. The function, which is planned for early December, is

set up to orient the underclassmen in the EE department and acquaint them with HKN and what it stands for.

In its service of helping the faculty, Beta-Beta chapter also has big plans. Realizing the value of visual aids and demonstrations, the chapter is contacting Philco Corporation in an effort to get a breadboard circuit of a television set.

Another particularly worthwhile endeavor was undertaken in this field when one member took it upon himself to set up a series of notes and problems for a course in "Electric and Magnetic Fields." This particular course has been giving sophomore EE's trouble for many years. The chapter has the approval of the faculty in this endeavor. These notes were set up with the idea of getting the student to understand and use basic fundamentals.

Beta-Beta Members at Meeting of New York Metropolitan Council

Left to right: Donald Jackson, Jerome Herman, George Parker, Victor Milukas, Robert Staffin, Edward Burke, Abe Bernstein, Ronald Digilco, and Jean Develet.

BETA-ZETA CHAPTER
(New York University)
By Charles A. Passavant

Fall activities for Beta-Zeta are now in full swing with the coming election and induction of new members at the forefront. Incidentally, present membership includes fifteen students, eleven of whom are evening students.

Our internal organization was first settled by the election of new officers and the appointment of various committees. Our group then started the new year with a resumption of past activities and a new accomplishment to our credit.

The activities which were begun in previous years were resumed. Our first newsletter received such favorable and encouraging comments from the alumni who had lost contact with HKN that a second letter is now in the making and should be sent out very shortly. Our chapter is also cooperating with the EE department and with other student organizations for the "Engineering Open House" held every year; by preparing exhibitions and conducting tours of the University's facilities, we try to get high-school students interested in the engineering profession. Representatives of Beta-Zeta at the Metropolitan Council are still collecting data for their important survey of the graduate courses offered in our city.

As in the past, we are working with the AIEE-IRE student branch; in fact some of our members are officers of that organization. Our major accomplishment was carried out with their help: a student information center was created. The aim of this center is two-fold: it tries to give advice and assistance, such as tutoring, to needy students; and it also sponsors extra-curricular research projects of gifted students. For this research work, the EE Department has agreed to supply the needed equipment.

BETA-EPSILON CHAPTER
(University of Michigan)
By Henry W. Mosteller

The beginning of this semester found the University of Michigan's College of Engineering having a Centennial celebration. An Open House was in order and Eta Kappa Nu was very active in providing guides and demonstrators of laboratory equipment. Charles E. Wilson, the Secretary of Defense, was on hand to speak at the convocation.

The new members inducted this Fall are: John T. Stone, John M. Harlan, George W. Baumann, Jr., Norman L. Adsit, Frank D. Mc Neill, Donald D. Majeske, Ward D. Getty, and Theodore Ploughman. As in the past, at our informal induction, the pledges will be put to work calibrating the laboratory meters. Our formal initiation will be held at the Michigan Union November 17, 1953.

So far this semester we have been active in planning and cooperating with the Student Branch of AIEE—IRE, as our President is also the Vice-Chairman of AIEE—IRE. Some of the activities that are now in the planning stage are a suggestion box to be mounted on the HKN—AIEE—IRE bulletin board, and a tutoring service which will be available to all interested EE students.

BETA-THETA CHAPTER
(Massachusetts Institute of Technology)
By Karl Sterne

Beta-Theta started the fall semester with only fifteen undergraduate members, but a pledge class of nineteen aspiring "Steinmetz's" promises to swell the chapter's number in a hurry.

Beta-Theta's perennial pledge project consists of expanding and revising the widely distributed HKN Thesis Suggestion List, in which EE staff members describe projects suitable for the thesis which is required of all MIT graduates in electrical engineering. This list has grown to 90 pages and is substantially up-to-date, so the present pledge class is compiling a companion list which will describe and evaluate from the student's point of view most of the 100-plus electrical courses offered by MIT above the Sophomore level. We hope to send copies of the list to all HKN chapters, as especially the graduate courses should be of general interest.

Another pledge project is to plan the traditional stag party, and everyone is looking forward to the liquid refreshments and amateur entertainment promised.

Officers for the fall semester are: Paul Gray, President; Fred Kreitner, Vice President; Milton Almquist, Secretary; Jim Duane, Treasurer; and Karl Sterne, Bridge Correspondent.

BETA-IOTA CHAPTER
(State University of Iowa)
By John V. Wait

The names of our officers for the Fall semester, 1953 are: Robert Cooper, President; Samuel Syverud, Vice-President; Richard Stapleton, Recording Secretary; John V. Wait, Corresponding Secretary; David Carson, Treasurer and Melvin G. Bebee, Bridge Correspondent.

We are considering prospective initiates at present; our active membership now consists of the five above mentioned men. We are also planning a chapter project

which involves painting the new student lounge in the Engineering building.

BETA-MU CHAPTER
(Georgia Institute of Technology)
By Gerald B. Rosenberger

October 29, 1953, Beta Mu chapter was well represented at the annual Georgia Tech Activities Fair. The purpose of this "Fair" is to acquaint incoming freshmen with the purpose and functions of various organizations on the campus. Beta-Mu chapter was represented by several technical displays and informative posters.

Sixteen candidates for membership have been invited into the chapter as a result of elections held November 3, 1953.

Beta-Mu chapter is very proud of what we consider a large number of graduating members who have been accepted into the graduate school. We feel that this reflects highly on the standards of Eta Kappa Nu.

Plans are now underway for publication of a news letter by the chapter which will be forwarded to all Ga. Tech alumni members of Eta Kappa Nu. The primary purposes of the newsletter are to stimulate the interest of the alumni members in THE BRIDGE, to keep them informed of chapter activities, and to encourage them to submit articles of professional interest to be forwarded to the Editor of THE BRIDGE.

Other plans include definite steps taken towards the erection of a mounted bridge monument in front of the Electrical Engineering Building in recognition of the Fiftieth Anniversary of Eta Kappa Nu next year.

BETA-OMICRON CHAPTER
(Marquette University)
By Roland Semrad

At the present time our chapter is engaged in the process of inducting its Fall eligibles. Pledge duties include regular chapter activities such as processing "Instructor Rating Forms" and "Student Study Habits Questionnaires." Formal initiation ceremonies will be culminated in a chapter banquet in early November.

Beta-Omicron, in conjunction with other engineering honor societies, will crack the early 1954 social ice by sponsoring a dance. The wheels are also turning for active participation in the Spring Open House, but adequate time-out is being reserved for an all-out alumni BRIDGE-subscription campaign.

An enrollment check discloses that as of the Fall registration there are 142 freshmen, 96 sophomores, 57 juniors and 64 seniors in the EE curriculum. 11 members are back this Fall, including the present officers of the chapter: Ralph Reinke, president; Austin Harty, vice-president; Robert Butcher, recording secretary; Stephen Felzo, corresponding secretary; Robert Matar, treasurer; Roland Semrad, BRIDGE correspondent.

BETA-PI CHAPTER
(The City College of New York)
By Samuel Levy

We of Beta-Pi chapter under the direction of Mel Scherer have accomplished much during this semester. Our insurance plan is offered to all students who take

NEW MEMBERS OF BETA PI CHAPTER

Bottom row, left to right: Peter Lequerique, Dorothy Schnabel, Demos Eitzer. Second row: Thomas Lynch, Chester Lonnquist, Samuel Levy, Stanley Goodman Top row: Richard Eng, Anthony D'Andrea, Fred Romani.

electrical engineering labs. This semester we were able to cut the coverage fee by 50% because of the huge response of the students and yet keep the insurance at its present level of Two Hundred Twenty Five Dollars per squad per term. Our members are doing an outstanding job in other student organizations; Demos Eitzer is president of the AIEE and Stanley Schinners is president of IRE.

At our last dinner twelve students became members of Beta-Pi chapter. Accompanying is a photo of the inductees, except for Bernard Kushner and Harold Klipper who were camera shy. Professor Henry Hansteen, chairman of our EE department, presented the Eta Kappa Nu certificates. Dorothy Schnabel is the second woman member of our chapter here at City College of New York; Professor C. Froehlich, of the Electrical Engineering faculty, is distinguished to be our first woman member. Mr. Henry Seligson from the division of Human Engineering at the Office of Naval Research presented an extremely interesting and informative lecture on "Human Engineering." Mr. Seligson discussed the psychological and physiological problems that the engineers may encounter. After a hearty meal, the initiates entertained with an original skit of three acts and with songs satirizing members of the faculty who were present.

Our slide rule instruction has picked up momentum and more lower classmen are taking advantage of this valuable opportunity offered to them. This term we have invited alumni members to our smoker and plan to obtain useful information concerning opportunities being offered at the present time to graduating seniors.

FORMER PRESIDENT KENNETH POPIS JOYOUSLY CONCLUDES HIS FAREWELL ADDRESS TO BETA-SIGMA LAST MAY.

BETA-SIGMA CHAPTER
(University of Detroit)
By Jerry Moynihan

At present we of the Beta-Sigma chapter are engaged in pledging new members, and in helping to promote an engineering show to be given at the University of Detroit early in the winter.

The object of our engineering show is to demonstrate scientific principles to the student body and to the public who are invited to attend. The materials used to demonstrate these principles are tin cans, cardboard and other discards which effectively eliminates cost. The devices made for demonstration are exhibited by and are lectured on by the engineering students who produced them.

It has been rumored that one of the pledge duties this fall will be to straighten out the chapter's storeroom in the basement of the engineering building. This room down among the steam-pipes contains our signs and booths used for spring carnivals.

INDUCTEES OF BETA-RHO CHAPTER SPRING 1953

Left to right: D. W. Porterfield, J. A. Rosi, G. R. Williams and C. M. Jenkins.

BETA-CHI CHAPTER
(South Dakota School of Mines)
By R. L. Day

The first week of school brought personnel representatives from several different companies to our campus in search of engineering graduates. There seems to be no doubt that each of our graduates will have a good choice of positions.

New initiates for Beta-Chi chapter last winter were Robert Smith, Darrell Brekke, Halvor Teslo, Henry Ablin, Roger Baird, and Raymond Day. Bob Smith has since been elected president of the chapter.

We were pleased by the visit of Dr. Kurtz. A banquet was held at the Bodega Cafe in Deadwood, S. Dak. after Professor Kammerman took our guest on a sightseeing tour of the Black Hills.

This year for the first time, Beta-Chi entered a float in the "M" Day parade. It took no prize but we were never-theless proud of our replica of the HKN key.

The monument in front of the EE building has been given a new coat of paint and we are preparing to bid for new members. Each freshman registered in electrical engineering has been given a copy of "A Worthwhile Goal."

BETA-OMEGA CHAPTER
(University of Connecticut)
By Ylo Ansu

Beta-Omega chapter held its first meeting October 1. Items of discussion were the fall induction, smoker and the freshman engineers' night.

The last induction of members was April 19, when the total of six members were initiated. The professional members inducted were: George W. Johnson, member of the EE Faculty, and Lawrence B. Grew, Transmission and Outside Plant Engineer with Southern New England Telephone Company. Upon completion of pledge tasks the following student members were inducted: Ylo Ansu, Robert J. Boucher, Roland A. Boucher and Roy W. Schneider. After the formalities and rituals the chapter had a banquet, where Dr. William F. Cheney of the department of mathematics was the guest speaker.

FLOAT OF BETA-CHI CHAPTER FALL 1953

The New England Radio Engineers Meeting was held at the University of Connecticut last April. The members of the chapter contributed their weekends and help the NEREM with exhibitions, administration and various other tasks. The chapter coffers benefited appreciably from these activities.

The meeting of April 27 marked the change in administration. New officers were installed as follows: President, M. Flavin; Vice-President, S. Altschuler; Treasurer, L. Murray; Recording Secretary, R. Schneider; Corresponding Secretary, R. Brennan; BRIDGE Secretary, Y. Ansu. Assistant Professor E. J. Robb resumed his duties as the faculty advisor of the chapter for the third academic year.

To celebrate the close of another successful school year, the chapter sponsored a picnic in June. In spite of the threatening weather the attendance was beyond that expected.

GAMMA-GAMMA CHAPTER
(Clarkson College of Technology)
By Lionel Arlan

Gamma-Gamma chapter looks forward to a very active year with the recent formulation of plans. The present student membership of our chapter consists of seven seniors but will be supplemented with the forthcoming induction of new members. The present class enrollment of EE students is as follows: Senior, 27; Junior, 46; Sophomore, 56; Freshman, 106.

Under the chairmanship of Harry Glass, we are attempting to establish relations between our chapter, alumni members and industry for providing summer employment opportunities for undergraduates.

Alumni members soon will be contacted as to their current subscription to THE BRIDGE. It is our desire to obtain new subscribers and to revive an interest in the activities of HKN.

Another plan which we hope to initiate in the near future is the sending of questionnaires to all alumni members as to their present achievements in the electrical engineering profession. This accumulated information will undoubtedly prove of much value to our chapter and help the faculty in nominations for the HKN Recognition of Outstanding EEs.

We intend to carry on our annual spring orientation of lower classmen in the EE department and to provide them with instructional aid when necessary.

Gamma-Gamma chapter recently was honored by a visit from our national president, Dr. Eric Gross. At a banquet given in his honor, Dr. Gross gave a very enlightening talk on the activities of HKN. We look forward to having Dr. Gross and other HKN members on our campus in the future.

GAMMA-THETA CHAPTER
(Missouri School of Mines)
By Joseph S. Watkins

It is believed that the coming pledge class of Gamma-Theta chapter will have a unique pledge duty. The town of Rolla, Missouri, in which the Missouri School of Mines is located, has recently purchased a plot of land to be developed into a park. There will be a work day in the latter part of November at which time the various service organizations of the town and the honor societies of the school will meet to start the development work on the park. Since Gamma-Theta chapter is included in the plans it was decided that the work would fit into the pledge duties and the actives, as well as pledges, will contribute to the program.

The light box to be used in Gamma-Theta's induction ceremonies has been completed and will be used for the fall ceremony.

Tentative plans are being made to award an outstanding freshman with a slide rule. The award will be made at the school's annual spring honor convocation.

CHICAGO ALUMNI CHAPTER
By George M. Ives

Since last spring the Chicago Alumni chapter has continued with its program of both luncheon and dinner meetings. The luncheon meetings are usually fellowship meetings with no principal speaker, whereas the evening meetings have a planned program.

The last evening meeting, which was limited to men only because of the requirement for security clearance, was held September 18. It consisted of a tour of the Argonne National Laboratories located southwest of Chicago. It was attended by over 60 alumni, students, and guests who ran into a little difficulty with rain.

The next event was a tour of the American Airlines facilities at Chicago's Municipal Airport Friday, November 6th. The tour started at 6:00 P. M. followed at 7:00 P. M. by the dinner—airline style. After the dinner the honorable mention certificate on college chapter achievements was presented to Delta chapter, followed by more touring of the airline facilities.

LOS ANGELES ALUMNI CHAPTER

By Arnold L. Rose

The Los Angeles Alumni chapter has had four successful meetings during the first ten months of this year. The year was bound to be a success after our annual policy meeting of all past officers on the University of Southern California campus February 17. Dr. George Harness, our 1953 "leading man" (Brother Harness is Dean of Electrical Engineering at S. C.), with the help of those present outlined a program which has resulted in a really enjoyable year's activities.

Our first event was a most interesting tour of the new multi-million dollar CBS TV-City installation in Hollywood which was attended March 6 by a near record crowd (for us) of 110 members, wives and friends.

Dinner-dancing at the famous Hotel Green in Pasadena was the theme of our second meeting May 15. We took this occasion to celebrate the election of Brother Carl Koerner to the National Advisory Board representing the western region. Knowing Brother Koerner as an outstanding supporter of HKN makes us feel sure that no man is more deserving of the honor.

Our third "doings" was our annual pot-luck picnic which was held August 8th at Beautiful Hillcrest Park, located just thirty miles south of Los Angeles in Fullerton. Seventy-five members, wives and children attended and enjoyed the outing.

September 29th we held our ever popular stag buffet supper at the Eastside Brewery. Brother Warren Jessup, who is patent attorney, entertained us with his celebrated talk (with slides) on "Odd and Interesting Patents." Fifty members and friends attended.

Our next scheduled get-together will be our Christmas party which has always been the outstanding event of the year for members and wives. It will be held the first week end in December so as to start the holiday season off with the right spirit.

MILWAUKEE ALUMNI CHAPTER

By A. G. Dahl

Thursday, October 8, the Milwaukee Alumni Chapter held an evening meeting at the Allis-Chalmers Clubhouse. At a short business meeting, the following officers were elected: President, R. J. Bronachuski; Vice-President, Brendon Nawn; Secretary-Treasurer, Arthur Dahl.

The main attraction was a talk by Professor Swenson of the National Advisory Board of HKN and head of the EE department at Michigan College of Mines and Technology. Professor Swenson discussed the present status of HKN and suggested ways and means of obtaining greater attendance at alumni chapter meetings.

A delayed showing of the film "Evangeline Land" was fully appreciated by the members. It was rumored that this film was held over from the last meeting when the lack of a projector operator prevented a considerable number of EEs from enjoying themselves.

The evening closed with the serving of coffee and doughnuts.

NEW YORK ALUMNI CHAPTER OF HKN HEARS TALK ON SUBSCRIPTION TV

By Alfred J. Land

The New York Alumni chapter, in a meeting held jointly with the New York alumni of Tau Beta Pi, opened the Fall season October 8th with a talk on subscription television. The meeting was opened by President John H. Craig, who welcomed back the members. He announced that this year, as in the past two years, each member would receive a questionnaire which will serve the dual purpose of bringing chapter records up to date and polling the membership on the types of meetings which they would like to have planned for the coming year. The letter also asks for a contribution to the chapter treasury. Brother Craig pointed out the fact that the voluntary contributions received with the returned questionnaires are the sole source of the chapter's operating funds for the year and expressed the hope that each member would enclose his contribution when returning the questionnaire.

The guest speaker of the evening was Mr. William J. Shanahan, chief electronics engineer for the Skiatron Electronics and Television Corporation, who described and demonstrated the results of his company's investigations into the field of subscription television. Mr. Shanahan first discussed the development of the television industry from its inception directly following the war to that which we know today. In his opinion, at the present rate of television's development, the concern of the industry is primarily with technical details and not enough emphasis is placed on program content. Under the U. S. system, operating costs are derived solely from the sponsorship of programs. With constantly increasing costs for talent plus technical operations, it becomes difficult to obtain sponsors to pay for the presentation of the best in cultural entertainment and the latest motion pictures. The speaker gave as one example the last heavyweight prize fight, which did not appear on broadcast television. Closed-circuit television, showing in only a small number of theatres throughout the nation, outbid all sponsors of broadcast television. Through some elementary arithmetic, it was shown how, with the payment of a nominal sum of fifty cents or seventy-five cents per family by viewers throughout the nation, subscription television could easily provide the best in entertainment, athletic events, drama, opera, concerts and the like.

Mr. Shanahan then proceeded to a technical discussion of subscription television. He listed four attributes which must be present in any subscription television system:

1. Pattern (and sound) must be disguisable.
2. Scrambled signal must be detectable.
3. Recipient of detected signal must be chargeable.
4. Scrambled signal must be codeable, with code readily changed.

Under Skiatron's system, the signal is scrambled by varying the starting point in the frame cycle of the horizontal sweep, according to a coded pattern. In order to receive an intelligible signal, the subscriber's receiver must vary its own sweep in the same manner. The subscriber's receiver is modified by the addition of a decoding box, which is connected by means of plugs which replace certain tubes of the receiver. Items 3 and 4 of the above list are accomplished by means of an IBM card which is inserted in the decoding box. The card has a printed circuit on its lower edge, concealed by a cover strip. The subscriber selects his programs by inserting the card in the box and pressing the button corresponding to the program listed on the square directly above the button. This accomplishes the dual purpose of marking the card for accounting and billing purposes and connecting the proper printed circuit with the decoder to make the television receiver operative.

The Skiatron Corp., as of the time of the meeting, was awaiting the approval of the FCC pending further action. If the system is approved, Skiatron feels that it can make its subscription units available to the public at approximately $15.00 per receiver.

CHAPTER DIRECTORY

Eta Kappa Nu Association

Chapter	Chartered Year	NAME OF SCHOOL	CHAPTER CORRESPONDING-SECRETARY
College Chapters			
ALPHA	1904	University of Illinois	Robert H. Hardin, 1314 W. University St., Urbana, Ill.
BETA	1913	Purdue University	Virko Keder, 100 S. Chauncey St., West Lafayette, Ind.
GAMMA	1907	Ohio State University	Richard M. Campbell, 16 E. 15th Ave., Columbus, Ohio.
DELTA	1909	Illinois Institute of Tech.	Russell Holt, 3300 S. Michigan Ave., Chicago 16, Ill..
EPSILON	1909	Penna. State University	Irving M. McNair, Jr., Box 709, Watts Hall, State 'College, Pa.
ZETA	1910	Case Institute of Tech.	John C. Hall, 2133 Abington Rd., Cleveland 6, Ohio
THETA	1910	University of Wisconsin	Thomas R. Benedict, 2933 Colgate Road, Madison 5, Wis.
IOTA	1911	University of Missouri	Richard B. Beall, 13A S. 9th St., Columbia, Mo.
KAPPA	1912	Cornell University	Theodore Flattau, 41-23 Case St., Elmhurst, L. I., New York
LAMBDA	1913	University of Pennsylvania	Walter F. Eichwald, 4232 Parkside Ave., Philadelphia 4, Pa.
MU	1915	University of California	Wilbur Twelker, Cunningham Hall, Hillside & Dwight Way, Berkeley 4, Calif.
NU	1916	Iowa State College	Gale Boehnke, 2228 Lincoln Way, Ames, Iowa
XI	1920	Alabama Polytech. Inst.	C. E. Hamilton, 2102 Magnolia Hall, Auburn, Ala.
OMICRON	1920	University of Minnesota	Knut Skaar, 2437 Sheridan Ave., So., Minneapolis, Minn.
PI	1921	Oregon State College	Leland C. Jensen, 1475 S. 3rd, Cabin 21A, Corvallis, Ore.
RHO	1922	University of Colorado	Russell B. Riley, 858 13th St., Boulder, Colo.
SIGMA	1923	Carnegie Inst. of Tech.	J. E. Laynor, Box 277, Carnegie Tech., Pittsburgh 13, Pa.
TAU	1923	University of Cincinnati	Eugene F. Schroeder, Housing Unit #31, Cincinnati 21, Ohio.
UPSILON	1925	Univ. of Southern Calif.	Francis J. Wunderlich, 633 W. 76th St., Los Angeles 44, Calif.
CHI	1926	Lehigh University	Philip Brassington, 232 Richards House, L. U., Bethlehem, Pa.
PSI	1928	University of Texas	Robert I. Vancil, 504 Elmwood Place, Austin, Texas
OMEGA	1930	Oklahoma A. & M. College	Edward M. Barnes, Jr., 2019 W. Admiral Road, Stillwater, Okla.
BETA-ALPHA	1935	Drexel Inst. of Tech.	Arnold Andre Weiss, 1257 Empire Ave., Camden 3, N. J.
BETA-BETA	1936	Polytech. Inst. of Brooklyn	Barry Berkowitz, 7118 21st Ave., Brooklyn 4, N. Y.
BETA-GAMMA	1936	Michigan Tech.	Harry L. Evans, 401 Garnet St., Houghton, Mich.
BETA-DELTA	1937	University of Pittsburgh	Joseph J. Lane, 751 7th St., Trafford, Pa.
BETA-EPSILON	1937	University of Michigan	Robert N. Newsom, 431 Williams House, W. Quad., Ann Arbor, Mich.
BETA-ZETA	1938	New York University	Burton Saltzberg, 1680 Clay Ave., New York 57, N. Y.
BETA-ETA	1938	North Carolina State College	John L. Pearson, 816 Hartford Rd., Raleigh, N. C.
BETA-THETA	1939	Mass. Inst. of Tech.	M. L. Almquist, Jr., 32 Hereford St., Boston, Mass.
BETA-IOTA	1939	State University of Iowa	John V. Wait, 516 E. College St., Iowa City, Iowa
BETA-KAPPA	1939	Kansas State College	Everett L. Westfahl, 909 Kearney, Manhattan, Kansas.
BETA-LAMBDA	1940	Virginia Polytech. Inst.	H. R. Skutt, Box 5625, Va. Tech. Station, Blacksburg, Va.
BETA-MU	1941	Georgia Inst. of Tech.	Jack C. Wilson, Box 4713, Atlanta, Ga.
BETA-NU	1942	Rensselaer Polytech. Inst.	Peter J. Barnikel, 6-1 Nott Drive, Troy, N. Y.
BETA-XI	1942	University of Oklahoma	Bill Dulaney, Niemann-D 10, Seminole House, Norman, Okla.
BETA-OMICRON	1945	Marquette University	Joseph T. Schulte, 3155 S. Illinois Ave., Milwaukee, Wis.
BETA-PI	1946	The City College of New York	Peter Lequerique, 1282 Waring Ave., Bronx 69, N. Y.
BETA-RHO	1947	West Virginia Univ.	Chester N. Jenkins, 11 Grant Ave., Morgantown, W. Va.
BETA-SIGMA	1947	University of Detroit	Richard L. Lane, 8625 Littlefield, Detroit 28, Mich.
BETA-TAU	1948	Northwestern Tech. Inst.	C. F. Samuelson, 103 Central Park, Wilmette, Ill.
BETA-UPSILON	1948	University of Kentucky	Frank R. Myers, 276 S. Limestone, Lexington, Ky.
BETA-PHI	1948	University of Tenn.	William H. Riggins, Jr., Box 34, Melrose Hall, Knoxville, Tenn.
BETA-CHI	1949	So. Dak. Sch. of Mines and Tech.	Darrell G. Brekke, 130 Kansas City St., Rapid City, S. D.
BETA-PSI	1949	University of Nebraska	John Tombarge, 1112 "Q" St., Lincoln, Nebr.
BETA-OMEGA	1949	University of Connecticut	Robert Brennan, Box U-37, University of Connecticut, Storrs, Conn.
GAMMA-ALPHA	1950	Manhattan College	Ralph Battista, 6063 54th Place, Maspeth 78, N. Y.
GAMMA-BETA	1950	Northeastern University	Richard B. Brown, III, 15 Mt. Vernon Ave., Braintree 84, Mass.
GAMMA-GAMMA	1950	Clarkson College of Technology	Harry J. Glass, 8 Clinton St., Potsdam, N. Y.
GAMMA-DELTA	1950	Worcester Poly. Inst.	Gregory P. Arvantely, 24 Institute Rd., Worcester, Mass.
GAMMA-EPSILON	1950	Rutgers University	Emanuel Kramer, 40 Baldwin St., New Brunswick, N. J.
GAMMA-ZETA	1951	Michigan State College	John O. Cheney, 374 W. Shaw Hall, E. Lansing, Mich.
GAMMA ETA	1951	Syracuse University	Richard Bruns, 219 Clarendon St., Syracuse 10, N. Y.
GAMMA-THETA	1952	Missouri School of Mines & Met.	Gene Reynolds, 702 Park St., Rolla, Mo.
GAMMA-IOTA	1952	University of Kansas	Clark C. Anderson, 1116 Indiana, Lawrence, Kansas
GAMMA-KAPPA	1953	Newark College of Engineering	William Kram, 121 Maple Ave., Newark, N. J.
Alumni Chapters			
Boston	1947		N. T. Jones, MIT Digital Computer Lab., 68 Albany St., Cambridge 39, Mass.
Chicago	1909		George M. Ives, Am. Broadcasting Co., 20 N. Wacker Drive, Chicago 6, Ill.
Cleveland	1920		
Denver	1938		R. Morgan Wilson, G. E. Co., 650 17th St., Denver 2, Colo.
Los Angeles	1923		Arnold L. Rose, 9904 Richeon Ave., Downey, Calif.
Milwaukee	1915		A. G. Dahl, Route 2, Box 137C, Mukwonago, Wis.
New York	1910		Frank W. Young, 339 Windsor Rd., Wood-Ridge, N. J.
Philadelphia	1917		J. H. Walton, Phila. Elec. Co., 900 Sansom St., Philadelphia 7, Pa.
Pittsburgh	1908		H. W. Bryan, Curtis Street, Wilkinsburg, Pa.
San Francisco	1925		Nelson L. Best, 15 Tamalpais Rd., Berkeley, Calif.
Schenectady	1913		John E. Hancock, Genl. Engrg. & Cons. Lab., G. E. Co., Schenectady, N. Y.
Washington	1936		Walter W. Kinsinger, 9908 Colesville Rd., Silver Spring, Md.

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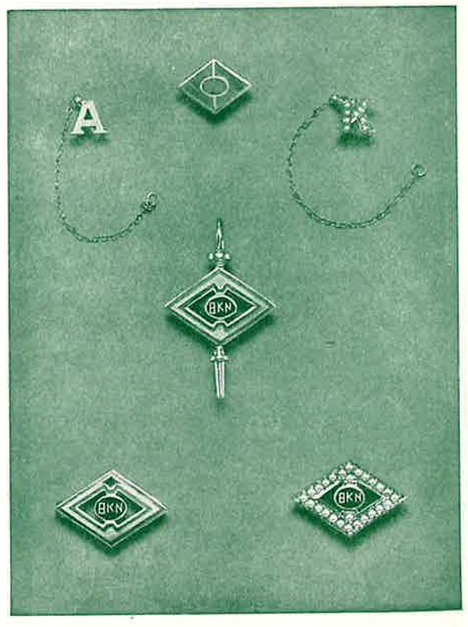

Top to bottom, left to right: Plain Guard, Pledge Button, Crown-Set Pearl Guard, Standard Plain Key, Standard Plain Pin, Crown-Set Pearl Pin.

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