



# The Bridge of H K N



**HOWARD HUGHES DOCTORAL FELLOWSHIPS.** Applications for the Howard Hughes Doctoral Fellowships in engineering, physics, or mathematics are now available for the academic year beginning in Autumn 1967.

The program offers the qualified candidate an outstanding opportunity for study and research at a selected university, plus professional industrial summer experience at a Hughes facility. Each Doctoral Fellowship includes tuition, books and thesis preparation expenses, plus stipend ranging from \$2,200 to \$3,100, depending upon the Program year and the number of candidate's dependents. Full salary is paid the Fellow during his summer work at Hughes. Salaries are reviewed periodically and increased with the growth of the individual. Fellowships are awarded to outstanding students who have completed a master's degree (or equivalent) and have been accepted as a candidate for the doctoral degree.

**HUGHES MASTERS FELLOWSHIPS.** Approximately 100 new awards for '67-'68 are available to qualified applicants with a baccalaureate degree in engineering, mathematics or physics. Most of these awards are Work-Study Fellowships; a very limited number are Full-Study. Upon completion of the Masters Program, Fellows are eligible to apply for and are given special consideration for a Hughes Doctoral Fellowship.

Fellows who associate with a Company facility in the Los Angeles area usually attend the University of Southern California or the University of California, Los Angeles. Tuition, books and other academic expenses are paid by the Company, plus a stipend ranging from \$500 to \$850 for the academic year. A significant advantage offered by the Work-Study Program is the opportunity to acquire professional experience working with highly competent engineers and scientists while pursuing the M.S. degree. Selected Fellows have the option to work in several different assignments during the Fellowship period to help them decide

on their field of concentration and optimum work assignment. Fellows earn full salary during the summer and pro-rata salary for 24 hours work a week during the academic year. The combined salary and stipend enables Fellow to enjoy an income in excess of \$6,500 per year during his two years as a Work-Study Fellow. Salaries are increased commensurate with professional growth and Fellows are eligible for regular Company benefits.

Work assignments are matched closely to the Fellow's interests. Primary emphasis at Hughes is research and development in the field of electronics for application to defense systems and space technology. Fields of interest include stability and trajectory analysis, energy conversion, structural design and analysis — computer and reliability technology, circuit and information theory, plasma electronics, microminiaturization, and human factor analysis — research, development and product design on such devices as parametric amplifiers, masers and lasers, micro-wave tubes, antenna arrays, electron-tube and solid-state displays, and components — design analysis, integration and testing of space and airborne missile and vehicle systems, infrared search and tracking systems, and computer, data processing and display systems — theoretical and experimental work in solid-state and ion physics.

**Citizenship:** American citizenship and eligibility for security clearance are required.

**Closing date for all applications:** Early application is advisable. All materials should be postmarked not later than February 1 for the Doctoral Fellowships, and March 1 for the Masters Fellowships.

**How to apply:** To apply for either the Doctoral or Masters Fellowship, write to: Mr. James C. Cox, Manager, Personnel Administration — Corporate Industrial Relations, Hughes Aircraft Company, P.O. Box 90515, Los Angeles, California 90009.

# Hughes Fellowship Programs



of **ETA KAPPA NU**  
Electrical Engineering Honor Society  
  
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Editor and Business Manager  
Paul K. Hudson

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**OUR COVER**  
Rose windows are among the loveliest things on earth. They are a never-ending source of spiritual inspiration. In honor of the approaching holiday season we are pleased to present a new rose just recently created. It was designed and built for the Unitarian-Universalist Church of Urbana, Illinois, by Creative Buildings, Incorporated. The photography is by Richard K. Koch, and the process color printing was done by Superior Printing Company.

The BRIDGE is published by the Eta Kappa Nu Association, an electrical engineering honor society. Eta Kappa Nu was founded at the University of Illinois, Urbana, October 28, 1904, that those in the profession of electrical engineering, who, by their attainments in college or in practice, have manifested a deep interest and marked ability in their chosen life work, may be brought into closer union so as to foster a spirit of liberal culture in the engineering colleges and to mark in an outstanding manner those who, as students in electrical engineering, have conferred honor on their Alma Maters by distinguished scholarship activities, leadership and exemplary character and to help these students progress by association with alumni who have attained prominence.

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# Real and Imaginary

The History of . . .

## CHRISTMAS CUSTOMS

Christmas is described in song as the season to be merry. It's also a season steeped with rich traditions — some of which evolved from customs practiced before the birth of Christ.

The use of greenery at Christmas, for instance, grew out of ancient Roman and Greek customs. Romans made lavish use of green boughs and garlands to honor Saturn, their god of agriculture. Greeks awarded laurel wreaths to victorious athletes.

Holly was a favorite Roman decoration. The Druids of an-

cient England thought it sacred. Mistletoe was regarded as a charm against evil in Greek mythology. It was a symbol of hope and peace to the Romans. The Druids believed it had healing powers. The Norse considered it to be sacred and a symbol of love.

It was in heavily-forested northern Europe that the Christmas tree custom was begun by St. Boniface, an eighth century monk. He converted the pagans living in what is now Germany, and ended their human sacrifices

(Continued on Page 21)



The Christmas season is steeped with rich traditions — caroling, gift-giving, nativity scenes, and others. One of the most popular customs is the sending of Christmas cards. Perennial favorites are Christmas cards with winter scenes like this one by the famed 19th century lithographers, Currier and Ives. This particular scene, entitled "Winter Pastime," was printed in 1870.

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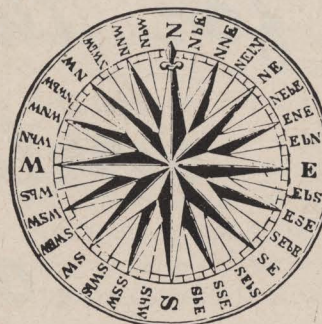
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## Go Westinghouse, Young Man!

*A modern fable with technical overtones.*



Once upon a time there was a young senior in college named Jack who couldn't decide about his future.

He wanted to do something worthwhile after graduation.

But there were so many things to do, it was hard to decide. He could go on to graduate school, or join the CIA, or volunteer for

social welfare service, or participate in a protest movement . . . or he could enter the business world.

Many of Jack's friends urged him to steer clear of big industry.

"There are no challenges in air-conditioned offices," they warned.

And it was a challenge Jack wanted — the kind of challenge his forefathers faced on the frontiers.

Then he met a Mr. Greeley.

Mr. Greeley recruited college students for Westinghouse Electric Corporation. He was a kindly man to whom Jack opened his heart.

Mr. Greeley described to Jack the exciting things being done by Westinghouse all over the world. \* Jack was fascinated and asked many searching questions about the world's 21st largest corporation. At the end of an hour, Mr. Greeley advised Jack:

"Go Westinghouse, Young Man." Jack did.

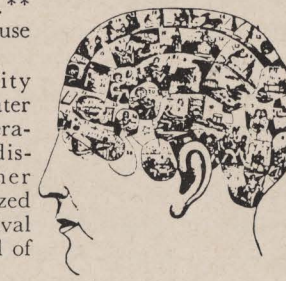
The first few weeks were difficult. There was so much to learn.

Jack was to discover that at Westinghouse, learning was a way of life, that a career with Westinghouse was one long process of education and re-education.

Later Jack was permitted to decide which of six big groups he would like to join. \*\* Jack selected the Westinghouse Electric Utility Group.

With the Electric Utility Group Jack learned about water processing, about power generation, about underground distribution, and many other things. Jack had not realized how important to the survival of modern man is the world of electric utilities.

It was hard work. Sometimes after a particularly trying day Jack would get discouraged. Then he'd remember the warnings of his friends, back at college. And he'd wonder whether he had done the right thing.



Then came Jill. Pretty, intelligent, warmhearted Jill. Jack had met Jill at the drinking fountain in the Utility Group Water Province Department.

Jill was an engineer with Westinghouse (Editor's Note: Women are welcome at Westinghouse, an equal opportunity employer).

Although the work became more and more difficult and the hours longer, Jack with Jill at his side persevered.

Then came an assignment to join a team of Westinghouse engineers

and scientists. The team was being sent to an underdeveloped nation in a faraway land to help rebuild a large coastal city.

Jack and Jill's assignment: Help build a power plant that would use nuclear fuel. (Nuclear fuel lasts longer than coal or oil. And it's cleaner.) Energy from the nuclear plant was used to change salt water from the nearby sea into fresh water that the poor people of this country could use as drinking water.

Working late one evening on the job site, Jack caught someone in the act of sabotaging the construction of an extra-high-voltage distribution system. This system would bring power from the nuclear plant hundreds of miles into the inland areas of the country.

After a dramatic chase through the winding streets of the city, a chase in which the international police and CIA participated, Jack captured the subversive agent. A grateful nation presented him with its highest award.

Finally, the project was completed. It was hard work but it was good work. Thanks to the Westinghouse team, millions of people would live better.

The citizens of the country were grateful. They wanted Jack and Jill and the others to stay . . . offered them more than their present salaries as an inducement . . . but Westinghouse fringe benefits more than offset this offer.

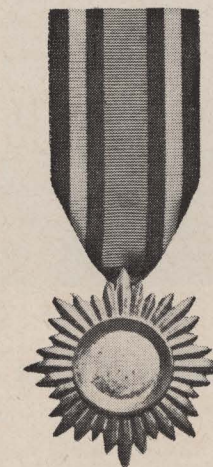
At the airport, where a sad but affectionate crowd of citizens gathered to see them off, Jack turned to Jill and asked:

"Will you marry me?"

Jill smiled and said: "I will if you promise to let me join you on other equally important turnkey projects that Westinghouse is coordinating in some of the major cities in the United States."

Jack promised, and they lived happily ever after.

Moral: Awaiting you at Westinghouse are challenges, hard work, building block education, adventure, some travel and, yes, even romance.



You can be sure if it's Westinghouse



For further information, please contact: L. H. Noggle Westinghouse Educational Center, Pittsburgh, Pa. 15221.

\*UNDERSEA EXPLORATION MASS TRANSIT WATER DESALTING AEROSPACE TRAVEL AUTOMATED PARKING GARAGES PROGRAMMED LEARNING TOTAL-ELECTRIC CITIES  
\*\*CONSUMER PRODUCTS INDUSTRIAL CONSTRUCTION ELECTRONIC COMPONENTS & SPECIALTY PRODUCTS ATOMIC, DEFENSE AND SPACE ELECTRIC UTILITY



# tomorrow

*educating  
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**J. Martin Klotsche**

CHANCELLOR

UNIVERSITY OF WISCONSIN  
MILWAUKEE



ny assessment that we make of the education of our people must be related to the needs of the future rather than the requirements of the present. For the task with which we are faced is to prepare our people for a world which is not yet in existence. The present is moving so fast and changing in so many ways that much of what is relevant today will be of no consequence tomorrow and that which we think urgent today may have no appreciable significance in the future. Changes are so rapid and breathtaking that the present and future are connected by only the slenderest of threads. For yesterday's fantasy is already today's reality, while today's miracles will become tomorrow's commonplace.

In this context there are certain facts about our environment which we cannot ignore and which we must understand and accept if we want to view our task with wisdom, imagination, and a sense of purpose. To begin with, there is the fact as well as the rate of change. If changes were to be no greater in the future than in the past, we would still face a radically different world tomorrow. Actually, however, the changes that now occur overnight would have taken years or even generations to accomplish in the past. For change is not constant but is occurring at an accelerated pace.

It took Charles Lindberg as long to fly to Paris in 1927 as it took Astronaut Cooper to go around the world 22 times in 1963. In 1908, Orville Wright was awarded a contract for \$25,000 if he could stay in the

air for one hour and travel 40 miles per hour. Compare this with the 800 lb. spacecraft which took off from Cape Kennedy last summer. Sixty-eight hours later it had travelled almost 250,000 miles. It took 75 years for Copernicus' discovery that the earth revolves around the sun to be mentioned in the curriculum at Cambridge. By way of contrast, only 32 months elapsed between the first atomic chain reaction at the University of Chicago and the dropping of the atom bomb on Hiroshima.

For purposes of illustration let us compress the life of man into a 50-year period. In that event man would have spent the first 49 years of his existence in a nomadic state seeking food, clothing, and shelter. Six months ago he would have learned how to read and write. As recently as a fortnight ago he would have invented the movable printing type and the microscope and discovered the circulation of blood, the law of falling bodies and gravitation. One week ago he would have discovered the application of electrical energy, the use of ether, he would have invented the internal combustion engine, the gyroscope, the modern gun and revolver, the sewing machine, the steamboat, the telegraph, the telephone, and the typewriter. As recently as yesterday he would have invented the radio, television, the airplane, the automobile, radar, and insulin. This morning he would have discovered jet propulsion, aureomycin, penicillin, and the anti-polio vaccine; and sometime before the end of this day, he will have landed successfully a man on the moon.

The changes that are occurring are indeed breathtaking. Those

that have occurred in the last decade are greater than those that have taken place in the last 100 years. For the whole metabolism of our life has changed. Yet our people are not yet ready for such a world and because they are not, we are faced with the prospect of a complete breakdown resulting from our failure to adjust to change. If we want to survive in the future, we had better face up to the fact of change as well as its accelerated tempo.

Rapid change has also been accompanied by a fantastic explosion of knowledge. Knowledge doubled between 1750 and 1900, doubled again during the first half of this century, again doubled in the ten years from 1950 to 1960, and will do so once again in this decade. We will be spending more on research and development in 1966 than we spent for this purpose from the beginning of our history until the end of World War II. Over one-half of the research and development expenditures made in this country since the founding of our republic have occurred in the last half-dozen years. There are almost 100,000 technical journals being published today carrying over 1,000,000 scientific and technical articles. One of the biggest abstracting services, the Chemical Abstract Service, regularly reviews over 8000 journals in 52 languages, and in one year abstracted 150,000 articles which filled 22 issues and contained more words than could be found in the Encyclopedia Britannica.

Because of the great additions to learning and because of our inability to keep up, we are teaching many things that are no longer so. In a sense this has always been the case. We taught, for example, that the earth was flat

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long after it was known that this was not the case. And this gap in learning and teaching has continued and is evident in all fields of knowledge today. Professor Galbraith in "The Affluent Society" refers to the knowledge which is accepted at any given time but usually runs behind reality as "the conventional wisdom." He suggests that a great deal of our trouble is caused by attempting to solve today's problems with yesterday's truths and prejudices. As a result yesterday's truths have become today's stereotypes and in large areas the march of events has left the conventional wisdom sadly obsolete.

The gulf of ignorance in our society has been widening not because the capacity of the individual to learn has diminished but because the quantity to be known has increased. A walk through the stacks of any one of our great university libraries is a humbling experience for any one of us, for it conveys in a dramatic manner the staggering accumulation of knowledge which has occurred in recent years. Indeed all of us are going to have to develop new techniques and methods for keeping abreast in our respective fields if we want to have any security in the future or have any feeling that we are on top of our job.

Nor has the impact of automation been fully grasped by our people. The Research Institute of America recently released a disconcerting report concluding that our people are totally unprepared for the approaching crisis. It suggests that automation is just beginning to bite in and that major systems are now complete and will soon begin to spread rapidly. When this happens it will affect everything in the office, the plant, and society itself. For automation is more than just

mere mechanization. It is mechanization, plus control, plus feedback with automatic machines controlled by other machines which are self-inspecting, self-adjusting, and able to correct their own errors.

An economist recently declared that in the future 2% of our population would be able to produce all the goods and services needed to feed, clothe, and shelter our people. This may well be an exaggeration but it is fact that very few jobs are going to be safe for any of us in the face of technology and automation. Cybernation promises unlimited productive capacity with progressively less human labor and the impact will be felt at all levels, white collar as well as blue, management as well as clerical. In the automated telephone industry, for example, in a ten-year period, the number of inexperienced operators were reduced by 40% while the volume of traffic increased 65%. The machine bookkeeper in our banks has become almost extinct as a result of the new systems that have been established. In 1960, for example, two large New York City banks hired 144 machine bookkeepers; in 1962, they hired only 5; in 1963, none. Automation is not just another technological advance anymore than the splitting of the atom was just a new form of explosion. Rather it is causing a basic reordering of man's relationship to his environment and those who do not recognize this fact of life will be lost in the shuffle, for problems will get away from them and they will give up in disgust and frustration.

One of the most important by-products of automation will be time and lots of it. Call it what you please—leisure, idle time, or unwanted hours—but we are go-

ing to have it in great abundance. People will be living longer and the work week will be shorter. Life spans of 85 to 90 years are a distinct possibility by the end of the century and the work week will certainly be reduced. For during the first half of the century we reduced the work week by one-third. We should be able to reduce it by another one-third in considerably less time. Yet we have not grasped the implications of a society in which fewer people will be involved in the productive system at the same time that products will be manufactured without any effective limit. Some economists are suggesting that we will need only one-half of our present labor force ten years hence. For a society which has been work oriented this is going to be a difficult adjustment to make. Yet we will need to find a way for man to live in a social system where there are not enough conventional jobs to go around, and where there is no need to limit consumption because of our inability to produce. Stuart Chase some years ago asked whether we were capable of developing a society that does not depend on work to give it meaning. This is a very proper question to ask and one that we can not ignore.

What does all this suggest in terms of our educational needs? It suggests that each of us must continually keep learning to keep abreast in his own field and of the times. Life-long learning used to be a favorite bromide of commencement speakers. But now it is the most important ingredient in the educational revolution that is taking place. There was a time when life moved slowly and changes were unobservable. In such an environment formal schooling seemed adequate to prepare people for all of the prob-

lems of later life and once a person was prepared there was little need for further education. The skilled craftsman who grasped his trade, the doctor who knew his alchemy, and the teacher who learned the fundamentals were able to face the future with security and safety. But this is no longer true. For we are all faced with amazing and even devastating vocational and professional readjustments. It was recently estimated that a person entering the labor market at the age of 20 could expect six job changes during his working life.

In many ways man is becoming obsolete. Yet he can avoid obsolescence by the process of continuing his education. We need to keep learning to hold our jobs, for great occupational shifts are occurring. Many jobs will be created in the future which are non-existent today and many jobs exist today that will be gone tomorrow. We cannot possibly anticipate what these changes will be now. We must, therefore, be prepared to move back and forth freely from one occupational category to another. This is true not only of the unskilled and blue collar worker, but it is true also of middle management and the professions. It was recently estimated that one-half of the professional knowledge of the engineer becomes obsolete within ten years. An engineer who is now 35 years old graduated prior to the time that courses in nuclear physics, inertial guidance, feed back control, solid state physics, and plasma physics were offered in our universities. Yet industry demands that he be informed about these things. Equally dramatic are the changes in all of the other professions.

Unfortunately, our colleges and universities have not accepted their full responsibilities in this

regard. Too often adult education has remained the stepchild of the university. There is a lack of conviction and commitment about it inside the institution. Often it is used for public relations purposes, for money raising, to gain political support, to keep communities satisfied or to create a favorable image. One of my colleagues at the University of Wisconsin has stated the problem well when he has concluded "But let the issue be in terms of allocating cold cash and warm bodies of faculty members to the institution's continuing education program and actions become weaker than a thousand words." Opportunities for continuing growth and education is one of the keys to many of our problems and if properly nurtured and supported adult education can become the means by which the imagination, inventiveness, and creative power of the individual can be fully exploited and organizations and institutions improved in such a manner that they can cope with change and remain flexible and adaptable in form, purpose, and operation.

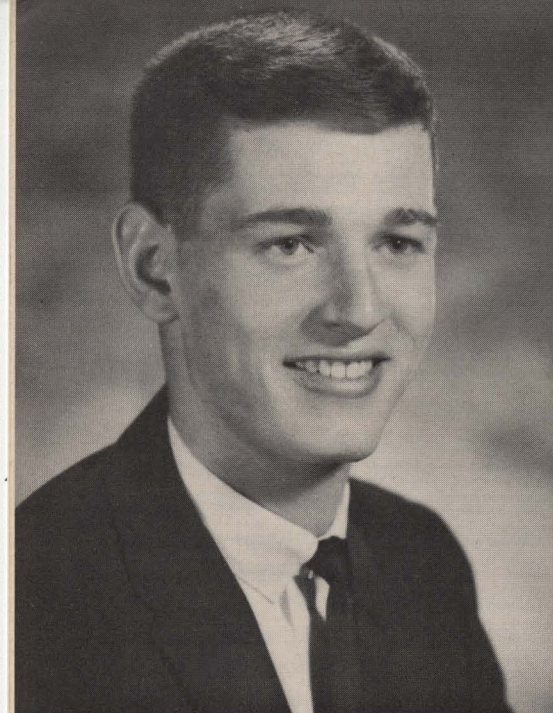
But there is more to the matter than improving oneself in his own specialty or field. For the essence of leadership is to live successfully with uncertainty and be challenged by it. This can only occur if we are persons of broad knowledge and capable of original thought. Somehow we have fostered the notion that the efficient person is one who makes fast decisions, who can accomplish changes with great dispatch, who can speed things up—in other words, the man of action. Quite the contrary is the case. A good leader is one who takes time to think, to reflect, to consult, to talk, and one who keeps abreast of the best thinking of his day not only in his own field but in broader areas as well.

No one can predict with any accuracy what the future requirements of our society are going to be. Shortages that exist today may prove to be areas of plenty tomorrow. With the dramatic changes that are occurring it is hazardous to predict the framework of the future. Yet we are posed with a serious dilemma in that modern man faces on the one hand a simultaneous demand for technical mastery and broad understanding on the other. He needs the former to survive in technical age but the narrowness of vision which results if he concentrates on this at the expense of general comprehension can eventually destroy him. Adaptability to change, therefore, is the greatest challenge that faces each one of us. We must be prepared to test, to use, and understand in the future things, concepts, ideas which are non-existent today. We need especially to equip our people with enduring knowledge and with a background to do things tomorrow that they do not have the slightest thought of doing today. In short, education must provide our people with the knowledge about the "big questions" which for hundreds of years have stimulated man's thinking and profoundly affected his actions.

We need especially to think conceptually about information which each of us has amassed. Facts are important but the retention of fact is not the primary function of the mind. This is a function of the calculator, the encyclopedia, and the dictionary. The purpose of the mind is to understand and facts are simply a preparation for understanding. There is something frightening about the explosion of knowledge which is occurring if it is unre-

(Continued on Page 10)





**Thomas L. Thomas**

Mr. Thomas Luther Thomas, the designated Outstanding Electrical Engineering Student for 1966, ranked second of 98 Senior Electrical Engineering students while completing both a BEE (Summa cum laude) and an MSE degree in four calendar years. He has been honored with memberships in Eta Kappa Nu, Tau Beta Pi, Phi Eta Sigma, Sphinx (outstanding Senior men), Texnikoi (engineering leadership and service), President's Scholarship Award, and placed on the Dean's List for 12 quarters. Mr. Thomas was named by Tau Beta Pi as Outstanding Sophomore Engineering Student at OSU. In 1965 he was named as the No. 1 student in OSU College of Engineering and selected as one of seven outstanding college students in the United States by Parade Magazine to tour Spain and Portugal. He was selected to deliver the Senior Address to the OSU graduating class of about 3,000 as the 1966 Class President.

Mr. Thomas has served as Vice President of Ohio Staters, Inc., the largest campus service organization; Vice President of the Electrical Engineering Senior Class; on the Staff of the "OSU Engineer" Magazine; a member Electrical Engineering Student Council; Student Chapter of

IEEE; Upsilon Pi Upsilon, a campus service organization; and Delphi, a service group to assist new students.

Mr. Thomas was selected in national competition to receive National Science Foundation Graduate Fellowship Award during his Junior year and was also awarded three other competitive scholarships.

Mr. Thomas has worked part time as a technical assistant in the Mechanical Engineering Department doing computer programming and other course support. He has worked on departmental research projects. His

summer work has involved OSU public relations, digital systems engineering on the Apollo Moon Rocket Program, zinc mining, factory and farm work to financially support his college education.

Mr. Martin Edward Hellman ranked first of 54 Senior Electrical Engineering students at New York University while completing a BE, Electrical Engineering, Magna cum laude, and carrying extra credits for the National Science Foundation. He has been honored with memberships in Eta Kappa Nu, Tau Beta Pi, Sigma



Mr. & Mrs. Thomas L. Thomas at the head table of an Eta Kappa Nu luncheon in their honor at the Los Angeles Hilton Hotel, August 25, 1966

# THOMAS L. THOMAS

OF OHIO STATE UNIVERSITY  
Selected by Eta Kappa Nu as the  
Most Outstanding E. E. Student in the U. S.

HONORABLE MENTIONS TO  
Martin Hellman, David Woolf, Joseph Zuercher



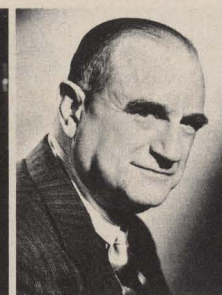
Dr. H. H. Beverage



Dr. G. S. Brown



Dr. L. A. DuBridge



Dr. A. N. Goldsmith



Dr. F. E. Terman



Dr. A. M. Zarem

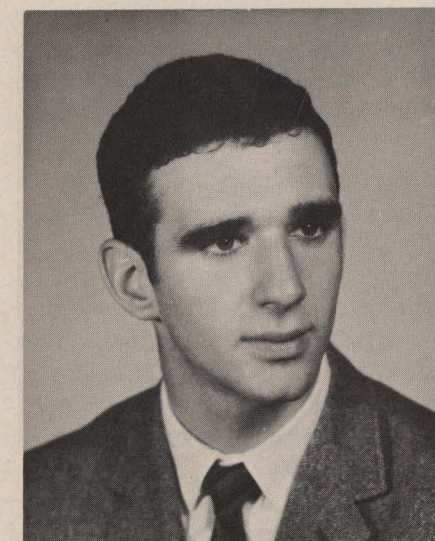
## JURY OF AWARD 1966

Pi Sigma; placed each term on the Dean's List; received Chemistry Award from Lafayette Radio Company; Outstanding Student Award, Army ROTC; and named the Valedictorian of School of Science and Engineering. He has held numerous offices in the organizations already mentioned as well as NYL Amateur Radio Club, Sailing Team and membership in the IEEE Student Chapter. He has received scholarships from NYU, the New York State Regents and National Science Foundation undergraduate research grant. Mr. Hellman has published papers in optoelectronics and monolithic microcircuitry and was awarded first prize in the IEEE Student Paper Contest, second prize in Region 1 and is in consideration for national competition.

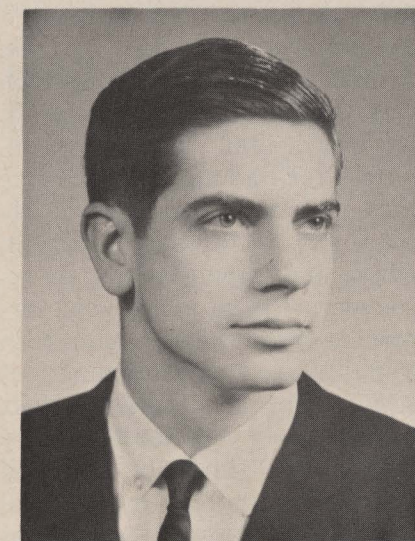
Mr. David Ellis Woolf ranked first of 70 Senior Electrical Engineering

students at Carnegie Tech while completing the BS degree in Electrical Engineering with honors in a special advanced course of study. He has been honored with memberships in Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi. He has served as President to Tau Beta Pi; Bridge Correspondent for Eta Kappa Nu; President of Carnegie Tech Amateur Radio Club; and as member of the IEEE Student Chapter. He has been awarded three competitive scholarships: the Carnegie Tech, the Mellon, and the Sloan Scholarship for five semesters. Mr. Woolf has published several technical papers in the "Carnegie Technical". He has worked part time as a research laboratory technician conducting experiments with semiconductor lasers, crystal growing, and nuclear and electron resonance phenomena. He is also active as an experimenter and amateur radio operator (K8RSP).

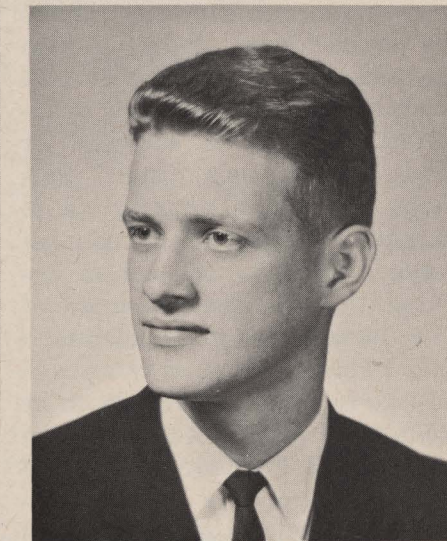
Mr. Joseph Charles Zuercher ranked first of 80 Senior Electrical Engineering students while completing the BS degree in Electrical Engineering with honors, at Marquette University. He has been honored with memberships in Eta Kappa Nu, Tau Beta Pi, Pi Mu Epsilon, Alpha Sigma Nu, and National German honorary society. He has received an award each year for the engineer with the highest academic rating. He scored 89th in the national Putnam mathematics test and is listed in "Who's Who in American Universities and Colleges". He has been awarded competitive scholarships by General Motors, by Weston Wabash Foundation and a stipend from the Indiana and Michigan Electric Co. Mr. Zuercher has published and presented numerous papers. He has studied seven semesters of German including two in Germany. Music, both vocal and instrumental, meteorology, and sports are his hobbies.



Martin Hellman



Joseph Zuercher



David Woolf



## EDUCATION (from page 7)

lated to the meaning of life. An explosion is a sudden breaking apart, a shattering or bursting into pieces as the explosion of gunpowder or a boiler explosion or the explosion of a shell. These illustrate the violent disruptions which result from such pressure. Knowledge to be meaningful should not be explosive in the sense of being disruptive or disjoining. Rather it should bring together into some sort of cohesive pattern ideas that are meaningful, insights that are sophisticated, and values that are worth preserving.

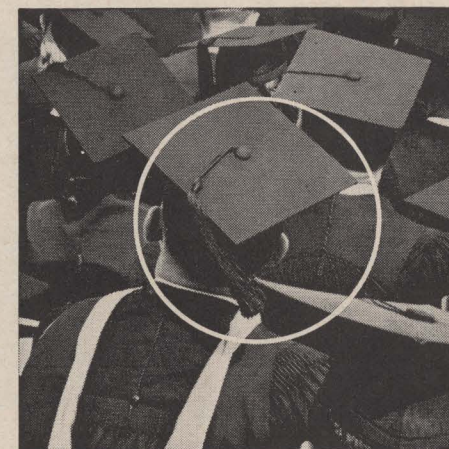
This is why we must give increasing attention in our educational discussions to the importance of a broad general education and the value of a liberally educated person. Never before, in fact, has the need been greater for people with a broad liberal education and one that is befitting and worthy of free men. For the responsibilities which we face are greater than ever before and we cannot possibly measure up to them unless we educate with a breadth of perception and a depth of understanding. We may not be willing to go so far as T. S. Eliot who said that a person was not educated "unless he pursued some study in which he took no interest, for it is a part of education to learn to interest ourselves in subjects for which we have no aptitude." Perhaps it is more appropriate to suggest that each one of us must have a capacity to connect his mind with the general mind of the human race and understand the whole of knowledge as well as one man can. Certainly to be considered educated, one must be a specialist not only in his own field but also have a slight suspicion that fields other than his own exists.

We all have our favorite definitions of the educated person, each to his own tastes, but the one that I have always liked reads as follows:

"A liberal education is the education which gives man a clear, conscious view of his own opinions and judgments, a truth in developing them, an eloquence in expressing them, and a force in urging them. It teaches him to see things as they are, to go right to the point, to disentangle a skein of thought, to detect what is sophistical, and to discard what is irrelevant. It prepares him to fill any post with credit, and to master any subject with facility. It shows him how to accommodate himself to others, how to throw himself into their state of mind, how to bring before them his wont, how to influence them, how to bear with them, he is at home in any society, he has common ground with every class; he knows when to speak and when to be silent; he is able to converse, he is able to listen; he can ask a question pertinently, and gain a lesson seasonable, when he has nothing to impart himself; he is ever ready, yet never in the way; he is a pleasant companion and a comrade you can depend upon; he knows when to be serious and when to trifle. . . . He has the repose of a mind which lives in itself, while it lives in the world, and which has resources for its happiness at home when it cannot go abroad. He has a gift which serves him in public, and supports him in retirement, without which good fortune is but vulgar, and with which failure and disappointment have a charm." These remarks strike me as a very contemporary view of the liberally educated person. Yet its author, Cardinal Newman, expressed these views over a century ago.

There are some interesting parallels that can be drawn between the new world that is opening up as a result of advances in science and technology and the age of exploration in the 15th and 16th centuries. Then the old world was shattered and a new world was opened up. Men ventured into uncharted and unknown areas and overcame myth and superstition. This was the age of exploration but it was also accompanied by an intellectual rebirth that tested existing hypotheses and challenged well established traditions. It was the age of da Gama, Columbus, Magellan, but it was also the age of Copernicus, Galileo, Michelangelo, Erasmus, Descartes, and Rousseau. It was a period that broke through the walls of the feudal system and prepared the way for the new world.

We are now in another age of exploration but of a new sort. We have penetrated outer space and by the end of this decade we will have no doubt landed a man on the moon. Obviously old ways are no longer adequate for such a world and a renaissance in thought and concept are required. For the astronaut who goes around the world in 90 minutes is oblivious to political frontiers and to old ideas of sovereignty and nationalism. He has been well prepared for his journey. But for the rest of us we are not yet ready for the world that the astronauts have opened up for us. Yet we have special responsibilities placed upon us as we think of educating ourselves for the world of tomorrow. For it should be our essential educational mission to prepare for an age of change, to provide a climate in which vision is enlarged and understanding increased and to prepare ourselves to strive for an improvement in the quality of our living.



## John Lauritzen wanted further knowledge



## He's finding it at Western Electric

When the University of Nevada awarded John Lauritzen his B.S.E.E. in 1961, it was only the first big step in the learning program he envisions for himself. This led him to Western Electric. For WE agrees that ever-increasing knowledge is essential to the development of its engineers—and is helping John in furthering his education.

John attended one of Western Electric's three Graduate Engineering Training Centers and graduated with honors. Now, through the Company-paid Tuition Refund Plan, John is working toward his Master's in Industrial Management at Brooklyn Polytechnic Institute. He is currently a planning engineer developing test equip-

ment for the Bell System's revolutionary electronic telephone switching system.

If you set high standards for yourself, educationally and professionally, let's talk. Western Electric's vast communications job as manufacturing unit of the Bell System provides many opportunities for fast-moving careers for electrical, mechanical and industrial engineers, as well as for physical science, liberal arts and business majors. Get your copy of the Western Electric Career Opportunities booklet from your Placement Officer. And be sure to arrange for an interview when the Bell System recruiting team visits your campus.



**Western Electric** Manufacturing and Supply Unit of the Bell System / An Equal Opportunity Employer

Principal manufacturing locations in 13 cities ☐ Operating centers in many of these same cities plus 36 others throughout the U.S.  
☐ Engineering Research Center, Princeton, N. J. ☐ Teletype Corp., Skokie, Ill., Little Rock, Ark. ☐ General Headquarters, New York City



# NEW OFFICERS AND DIRECTORS



**Clyde M. Hyde**  
PRESIDENT

Clyde Hyde was born in Staunton, Indiana, March 11, 1923. He was preceded into this world by a sister, Otela, and followed by a brother, Hubert. In 1940 Clyde was graduated from Van Buren High School, Brazil, Indiana. He received the BSEE degree in 1955, and the MSEE degree in 1956, both from Michigan State University.

During the summer of 1955, he worked for the General Electric Company as a project engineer. While at Cornell University he was a John McMullin Fellow and a Bell Aircraft Fellow. In June 1957, he was granted the PhD degree and immediately started his teaching career at the University of Nebraska. Three years later he became Chairman of the Electrical Engineering department, a post he retained until 1964 when he joined the IBM Corporation.

Dr. Hyde was married to Daphne Simpson in October 1942. They have two daughters, Peggy and Sandra, and a grandson, Clyde.



**William P. Smith**  
VICE PRESIDENT

William P. Smith is currently the Dean of the School of Engineering and Architecture and Director of the Engineering Sciences Division of The Center for Research at the University of Kansas in Lawrence.

Born in 1915 in Superior, Wisconsin, Bill earned his B.S. de-

gree from the University of Minnesota in 1936, his M.S. degree from Minnesota in 1937, and his Ph.D. degree from the University of Texas in 1950. His area of specialization is non-linear systems.

While at the University of Kansas, he has worked with General Motors Corporation in Kansas City and the Boeing Company in Wichita, and he has served as a consultant to the Office of Naval Research, the Midwest Research Institute, and Sanders and Thomas of Pottsdwn, Pennsylvania. He has published numerous technical articles.

Bill Smith's wife, June, is also Dr. Smith, having earned her degree in education from the University of Kansas. She is the director of special education for the Lawrence Public Schools. The Smiths have three children: Susan, who received her B.A. degree from the University of Kansas in 1964; William P., Jr., a student in the Lawrence High School; and Sally, a student in junior high.

## Henry L. Ablin

Henry L. Ablin will represent the West Central Region of Eta Kappa Nu.

A native of South Dakota, he received his B.S. in E.E. with highest honors from South Dakota School of Mines and Technology in 1953.



In 1955, he began his teaching career at Iowa State University as an Instructor, receiving an M.S. degree in 1959, and later becoming an Assistant Professor. In 1962, the student branch of AIEE-IRE elected him Instructor of the Year in Electrical Engineering. In the same year, he was also a runner-up in the election for Professor of the Year in the College of Engineering.

Since 1963, he has been Assistant Professor of Electrical Engineering at the University of Nebraska where he helped reorganize the electronics laboratories and taught courses in Electronics and Control Systems. He has been the chapter advisor to the Beta Psi Chapter of Eta Kappa Nu since 1965.

## William D. Bonser

The newly elected Director for the Western Region is William D. Bonser.



Mr. Bonser was born in Beaver City, Nebraska, January 11, 1925, was a participant in the Army Specialized Training Program at the University of Oregon in 1943 and received his B.S.E.E. from the University of Southern California in 1950. He has since worked with the California Electric Constructors Company (1950-52) as a designer and estimator of industrial electrical systems, with C. F. Braum & Company (1953) as an electrical designer of petrochemical related systems, and with Larsen Hogue Electric Construction Company (1954-65) in design, estimating and management. Mr. Bonser is presently establishing an engineering department for the Johnson-Peltier Electric Company. He has been a Boy Scout Leader since 1961 and was Trustee of the Presbyterian Church from 1959 to 1961.

Mr. Bonser was inducted into Eta Kappa Nu as a junior at the University of Southern California, has been active in the Los Angeles Alumni Chapter since 1950 and was President of this Chapter in 1958.

## John C. Hancock

Elected to represent the East Central Region is John C. Hancock.



Professor Hancock is Head of the School of Electrical Engineering at Purdue University. He received his Ph.D. degree from Purdue in 1957.

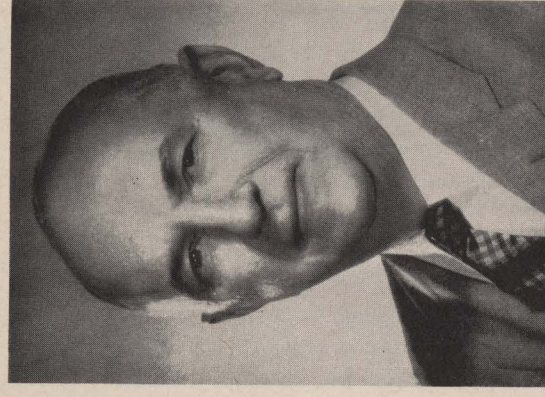
During this period from 1957, he has also acted at different times as electronic scientist and staff consultant at the U. S. Naval Avionics Facility, Indianapolis, Indiana, as a member of the technical staff at Hughes Research Laboratories, Culver City, California, and as a consultant to Ramo-Wooldridge Corporation, Los Angeles, California, Emerson Electric Company, St. Louis, Missouri, ITT Kellogg Space Communication Laboratory, Ft. Wayne, Indiana, Page Communications Systems, Washington, D. C., as well as to General Electronics Laboratory at Cambridge, Massachusetts.

He has credited to him over twenty-five published articles in scientific journals and presentations at national and international conferences.

## C. Holmes MacDonald

The Eastern Region will be represented by C. Holmes MacDonald. At graduation from the Central High School in Washington, Mr. MacDonald was awarded the competitive scholarship given to the District of Columbia by the University of Pennsylvania. There he was elected to Eta Kappa Nu in 1916.

Following receipt of a BS in E.E., he engineered open wire and toll cable projects in the Planning and Engineering Departments of the Bell Tel. Co. of



Pennsylvania. Carrier cable jobs and lecturing in the Bell Engineering School followed. Transferred to the Executive Operations Dept., for a final decade, he helped coordinate the many facets of several crossbar tandems and the four wire switching systems for Harrisburg, Pittsburgh, Scranton and Wayne, Pennsylvania.

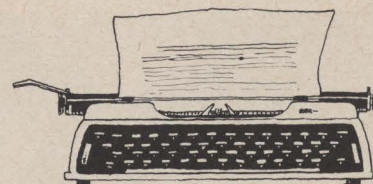
In Eta Kappa Nu, Holmes was one of the founders and the first president of the Philadelphia Alumni Chapter.

Son Edward H. is also a member of our Lambda Chapter and has served through the chairs of office of the Philadelphia Alumni. Furthermore Grandson Robert H. shows promise of being a candidate for initiation in 1973 into Eta Kappa Nu.





## LETTERS from Ellery



### ON COVETIOUSNESS

Dear Friends,

This is a very different "Story" from the ones I've been sending. This, instead of being written by me, was written by Stephen Paine, who was born in 1749 and was my great grandfather. The Grandmother of this man was Abigail Paine (buried on Woodstock Hill) who was carried captive to Canada by Indians in 1677 when they destroyed Hatfield, Mass. This man was Delegate from Woodstock at the Convention to decide if Connecticut would join the Union. And he voted against it.

What I am sending you is from the "PARENTAL INSTRUCTION" he wrote for his four sons. He wrote it in 1811 and thinking it would have more effect if they received it after his death he left it with a neighbor who never delivered it. This neighbor used the blank pages of the book for his boys for writing exercises in school and for the tax lists he gave the town listing his property. So the "Instruction" never came to light until after all the sons had died. I remember the day when my father got word the book had been found in an attic in West Woodstock.

Two years after Stephen wrote his "Instruction" he added two additions entitled "ON CHARITY"

and "ON COVETIOUSNESS" I have typed the latter and wonder what you think of what this man wrote and of the style he used in writing.

I have typed the words exactly as he used them and you will note a few cases which show the change in spelling or use of words since the time when he wrote. For instance the "wicked centinel" begins with "c" instead of "s" as would be done now. Also we now would not use "un-human" neither would we probably refer to the "necessitous" as people did in those days.

Compared with present times Stephen had had but little school training. Just a few weeks in the country school taught by a neighbor man or woman was all he had. But to me it seems he expressed himself very well.

When I once told Mother Hyde about the failure of the book to be delivered after Stephen's death she said that when the West Woodstock Church gave them a "Donation" soon after they went to have charge of the Church they were told by members from this family "We wanted to bring you some fine meat but it is frozen so tightly to the shelf we couldn't get any for you." I assume the members of that family did not read "On Covetiousness" in the book left in their charge. Or maybe they read but didn't follow the injunctions Stephen laid down.

I might add that the oldest of the four sons left home at an early age and never was heard of again. It was supposed he

went west and was killed by Indians.

Also I will say I think Stephen's wife Martha must have been an unusual woman. Doubtless she had seen her father Parker Morse handle wounds and so learned something about what to do in case of accidents. I think I have mentioned that when my Grandfather was very small in playing in the wood shed with his brothers his four fingers were cut off with the ax. Martha at once took the fingers from the chopping block and sewed them back in place. Father told me that scars went completely around each of the four fingers but Grandfather was not in the least crippled. Those fingers functioned fully in the normal way. Just the other day I heard of a man who had one of his fingers cut off and it was considered a marvel that the doctor put it back before the severed finger became cool.

I have written that I wish I knew about the boyhood of the men in my line before me. Perhaps from what Stephen wrote I do have a chance to learn a little about him as a man.

Greatest Love to All,

ELLERY

### ON COVETIOUSNESS

By Stephen Paine

Sunday, April 4th, 1813

Among all the vices which have entailed to human depravity perhaps Covetiousness is not one of the least, and seems to be the breast that suckles all other vices.

Covetiousness consists not only in withholding from but in aspiring after. The first of these was exemplified in the case of Lazerous, the latter was the downfall of Adam and all his posterity. Covetiousness like idleness has no advocate but many friends and like the skulking savage in the wilderness he bends his bow and points his dart at every virtue that comes in his way.

Covetiousness will often tell much about Prudence and sometimes attempt to dress up in Prudence's clothes, but being so deformed the garment never would fit the monster, and bear no more resemblance to each other than the wolf to the lamb or the serpent to the dove.

I have noticed that some learned writers have attempted to draw a line of distinction between covetiousness and meanness; for my part I know of but very little of any. True it is there may be some little difference in settling the reasoning, yet they journey on in company to the land of shame, misery, and disgrace. To trace covetiousness as it respects the overt acts of

man's life would be very difficult if not impossible.

However I will attempt to mention some. Covetiousness renders us unlike to that glorious being who formed man out of dust, and breathed in to him the breath of life. He openeth his hand and satisfieth the desire of every living thing. He gives to all men liberally and upbraideth not.

Covetiousness is a violation of one of the closing command contained in the sacred decalogue "Thou shalt not covet"

Covetiousness, like a wicked centinel, will open the door and let into the soul of man every other species of vice and wickedness. Covetiousness will bring on and lodge on the possessor of this vice all the miseries of poverty, however good or however great in abundance of the good things of this life God has been pleased to bless him with.

Covetiousness influences the parent not to divide the son his true portion. It influences the son to see his aged parent in tattered rags denying him that nutriment and support which he needs in his declining years and his trem-

bling limbs and exhausted state require. Covetiousness will prompt the possessor of this vice to neglect his best friends, and in the most unhuman manner to treat them with cruelty, scorn and abuse! How many poor domestics have suffered from this pernicious vice! How many murders, thefts, and robberies have originated from this vice. Even suicide has been too often found in the field of covetiousness.

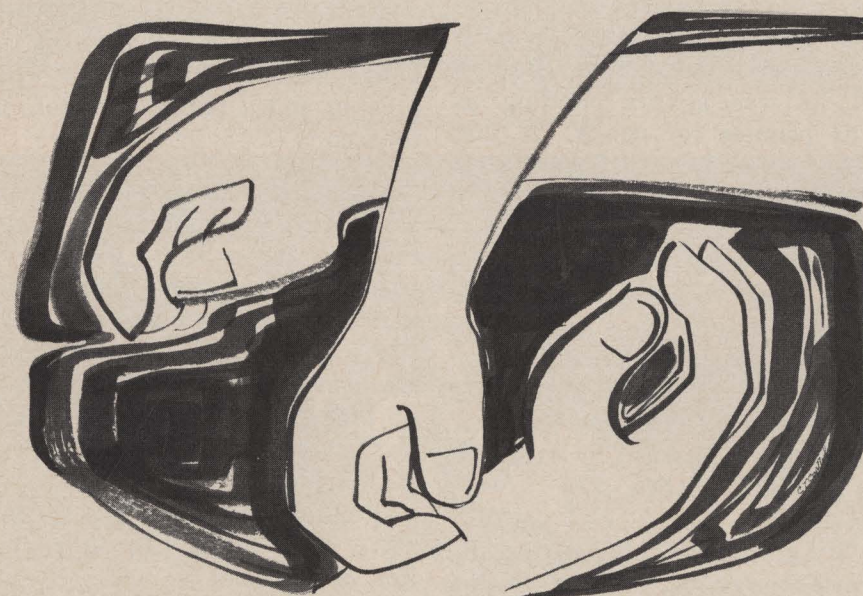
How will covetiousness callus the heart—contract the arm—shorten and shut the hand—blind the eye and deafen the ear to the cries and wants of the poor and needy and the necessitous.

Covetiousness unfits a man for all the social and elevated stations of human life. The qualification for a good ruler is one that fears God and hates covetiousness. It is not sufficient only that he avoid covetiousness but he must become a hater of it.

Covetiousness is a lonesome vice. Most other vices have some kind of brotherhood as affinity, but covetiousness has none. Even prodigality has long since drawn the sword upon this pernicious Vice.

My children, as Covetiousness is strictly forbidden in the word of God so I hope that solemn caution of your compassionate savior will ever have due weight on your minds to beware of Covetiousness. For a man's life consisteth not on the abundance of the things he posseth. Without further enlargement on this vice I shall conclude this piece in the poetical expression and language of Dr. Watts. He says, describing the covetious man:

Vain are his thoughts, his hopes are lost  
How soon his memory dies  
His name is written in the dust  
Where his own carcas lies.







## I FOUND GOD

I was not a particularly good little boy. I stole watermelons; I slipped away and went swimming Sunday afternoons; I lied now and then to avoid punishment for my childish misdeeds, and now and again I copied an example in arithmetic from the paper of some kid who was better at it than I was.

But I did attend church and Sunday School regularly. I recall that a Sunday School teacher once gave me a prize of a gold dollar for not having missed a single Sunday from Christmas until Christmas. I enjoyed Sunday School, especially the Old Testament, in which, at times, the history of the Jewish people and their wars was as exciting as the dime novels I read behind my geography.

My only unpleasant recollection of church is that my feet used to go to sleep while the preacher was talking. That was in the days when my legs were short, and the preacher's sermons were long.

That preacher used to confuse me a lot. He told me that unless I believed and was baptized, I would not be saved. As he was not in a denomination which baptized by immersion, he simply sprinkled a little water on their heads. He could fool them into thinking they had been baptized, but by golly he couldn't fool me!

I had seen people baptized. I had seen the other ministers lead people out into the Tennessee River and, putting one hand on their backs and the other over their mouth and nose, souse them under and lead them dripping wet ashore where the congregation stood singing halleluiahs and hosannahs. That was baptizing that was baptizing! I knew those folks had had all their sins washed away because I had seen it done.

Our minister confused my childish mind with his religious clichés. He told me I must be washed in the blood of the Lamb. I was too young to understand, but I had seen the local butcher kill and dress a sheep and the idea did not appeal to me at all. The vivid mental picture of the process did not please my boyish mind.

Our minister and the Bible said that it was easier for a camel to get through the eye of a needle than for a rich man to get into Heaven. The richest man in our town was one of my favorite people. He was nice to the folks who worked in his mill and always looked after their families when there was sickness. He had built a parsonage and given it to his particular church. Best of all, he was always handing us kids pennies for candy. It just didn't seem fair to keep people like him out of Heaven.

There were other religious facts, too, which bothered me. The one about being born again certainly was a puzzler for a boy who raised rabbits. It just didn't seem possible in the light of things I had learned by exposure to the facts of life.

My geography told me that the world was round. The Bible spoke of its four corners. There were

so many things I could not understand, and which were never explained, that my boyish mind was hopelessly confused. Finally I pushed it all aside and lost interest. Religion was like a toy I had tired of playing with and abandoned.

I know now that a lot of children get mixed up on religious matters and, not wanting to express their doubts and puzzles to their elders for fear of criticism or punishment, they wander away from God and lose Him forever.

It remained for a Tennessee mountaineer—they call them hillbillies these days—to bring me back to a consciousness of God.

In my teens I took a long hike through the mountains to reach a certain trout stream. I hiked along a mountain road to the foot of the Great Smoky Mountains and then followed a foot trail up to the top of the first range. The trail led along the very top of the mountain until it reached the next gap, and I paused to rest on the crest.

Two thousand feet below me the river lay twisted and lopping like a silver ribbon some child had thrown carelessly on a green carpet. Here and there along its banks were little clearings with a cabin and a patch of cotton or tobacco.

Across the river, tier on tier, were other mountains. The ones in the foreground were two shades of green, one in the light and one in the shade. The next tier were dark green and mauve shadows. Beyond that was a tier of blue ones with purple shadows, and behind that yet others all purple—so purple that they melted into the purple sky so perfectly that there was no visible line of horizon.

(Continued on Page 22)

## Epsilon Mu Chapter Installed at ARLINGTON STATE COLLEGE

On Saturday evening, April 30, pledges of the Gamma Omicron Chapter (Southern Methodist University) and charter pledges of the Epsilon Mu Chapter (Arlington State College) were initiated in a dual ceremony held on the Arlington State College campus. National Director F. W. Tatum, Head of the Electrical Engineering Department of Southern Methodist University, was the installing officer, and chapter representatives from the University of Texas, Texas A&M, and Texas Tech. participated in the event.

Five undergraduates were initiated by the SMU chapter. Among the 48 charter members initiated by the new ASC chapter, 29 were undergraduate students and 19 were professional members. Dr. A. E. Salis, Head of the E.E. Department, and Mr. John M. Goodwin, Associate Professor of E.E., were among the professional members to be initiated.

During the initiation ceremony, the ladies and guests were entertained in the E. H. Hereford Student Center by the wives of the E.E. faculty. Hor d'ouerves

were served, and a white guest register, lettered with gold leaf with the bridge symbol in gold, was used at the registration table as a permanent record of the attendance.

Following the initiation ceremony, a banquet was held in the student center. Dr. W. H. Nedderman, Dean of the School of Engineering, was the master of ceremonies. A varied program of entertainment was provided by local campus talent. Dr. F. W. Tatum, installing officer, formally presented the charter of the Epsilon Mu Chapter to Dr. J. R. Woolf, President of Arlington State College. Each of the pledges was personally presented with his certificate of membership and congratulated by Dr. Tatum.

Guest speaker for the banquet was Professor Ted A. Hunter, professor of psychology, State University of Iowa.

Arlington State College is a relatively new four-year school, having been elevated to four-year status in 1959. The student body numbers about 13,000, of which approximately 2700 are professional engineering majors. There are about 1000 electrical engineering majors, but only about half of these are upper classmen. The E.E. Department received a six-year accreditation from EC PD in November of 1965, and is looking forward to initiating a master of science degree program this fall. The School of Engineering is housed in a limestone slab finished building which was completed in 1960 and contains 90,000 square feet of floor space.



New Undergraduate Members







Miggs Pomeroy

# The Great Sahara Mousehunt

Catherine Collins  
and  
Miggs Pomeroy

On 13 March 1961 a group of 14 people started from the North African coastal city of Benghazi for a trip across the Sahara Desert just for fun and adventure. This is the second installment of the story of that hilarious journey.

14TH MARCH

THE STARS WERE bright and the night cold and we awaken in the morning to find ourselves covered with pools of icy dew. Boiling tea brings the blood back to our hearts and we attack our 'compo', sausages and hash hotted up over the primus, with appetite. Little boys from nearby Agedabia gather round to watch and Hank gives one of them the first discard of his twenty pairs of socks. Randolph complains that I had promised to look after him and where the hell are the bacon and eggs. So I carefully cook him two eggs which Winston eats, because the tea is gone and Randolph says he cannot stomach eggs without tea. It is a test and proves what I feared: he has no appetite. I even try to give him a vitamin pill, but Winston is right in saying he won't take those either. Catherine says he's going to develop a divine figure, and how do you lose your appetite?

We have packed up with last night's chaos fresh in our minds. Five cars have to carry twenty-five jerry-cans of petrol each, three each of fresh water, one of oil. Also distributed among the vehicles is a jerry-can of distilled water for the batteries and two of white petrol for the primus stove. The primus will work, if it has to, on regular petrol, but the lead in it would eventually clog the stove causing a poor flame, and in time no flame at all. Finding white petrol in Benghazi took a good half-day in itself. Each car has twelve cases of 'compo', various cases of our civilian food supply, spare parts, tools, sleeping and camping equipment, personal effects, and, always at the ready, sand tracks. We carry

our sand tracks (chopped-off pieces of World War II airplane landing-strips) tied to the bumpers in front. Put under sand-bogged wheels these give enough purchase to get the car moving again. We are also experimenting with strips of heavy canvas, a lighter and more portable sand track. The sixth car, a small open Land Rover, is mounted with the wireless. There is barely room for that, two men and their bags. Last night we had to unpack everything to find the stove and a can opener. We think we put ourselves together rather neatly today. We stop off to take pictures and fill up at the last petrol-pump we will see in five thousand kilometres. A curiosity, not a worry. Liv has arranged for petrol dumps to be sent ahead at Kufra, Faya-Largeau, Zouar and Sebha. If these are where we expect them to be there will be no problem. If they are not we will have to build huts and colonize whichever oasis has let us down.

Catherine has bought herself a barrakan, a blanket fourteen feet long. The Bedouin use these as robe by day, sleeping-bag by night, and sometimes as a prayer-mat or a floor-covering when guests are invited into the tent. Catherine's is a brilliant red, bordered with orange and blue. She says she was cold last night despite woollen pyjamas and a down-filled sleeping-bag.

At last we turn away from the coast on a bumpy track through scrub and sage brush. The sand is rubbly and red. After a few kilometres we have trouble with the radio vehicle. Everyone climbs under it except Alan who photographs the workers and advisers in action, and the Churchills who with flag flying disappear southwards. The radio car is definitely ramshackle. It has a canvas pannier on either side, a cockeyed antenna, a couple of much-travelled suitcases, a case of Coca-Cola and a handsome but ponderous radio. Four of the other Land Rovers, long wheel-based, are sleek and new; their chassis are neat with canvas covers lashed in place. Our vehicle is two years old and has seen a good deal of the world. It has a box-like station-wagon body with windows and doors through which all of our possessions can be seen like the displays in a pawnshop window. A blue tea-kettle is nested on top of a sheepskin and a mountain of camera equipment is wedged between a carton of chocolate bars and a suitcase, the lid of which is labelled hopefully, 'This Way Up'. Everything hops up and down frantically when we cross rough ground.

The little radio car takes an hour of skilled attention and then staggers a few more kilometres before breaking down again. At the third break we start talking of sending it back. It is late in the day and we will make camp. After supper the radio car and one army vehicle will go back to Agedabia. From there the radio car, with Jack Thompson driving, will return to Benghazi alone. Francis Gibb and John Ferguson in the army vehicle will catch us up on the track five kilometres south of Gialo, our first oasis. It's a hard decision, but obviously this car can never survive the trip.

During one of the delays today Hank Setzer opened up some mole-rat mounds. One rat poked his flat head out as he busily shovelled earth to stop up the hole Hank had made. The sand is crossed and criss-crossed with car tracks made by supply trucks running down to the various oil rigs. The Michelin map shows a neat, thin red line from Agedabia to Kufra indicating a 'piste', or trail. Sometimes it doesn't exist at all, sometimes it's a mass of tyre tracks, as much as twenty kilometres in width. We've made our camp under a low scarp but even in its protection, and with tarpaulins rigged, we can't get out of the wind. We're below sea level here, and the sand is littered with clam-shells and bits of petrified wood. While we make camp Hank and Liv set out a string of fifty mouse-traps in some nearby clumps of grass and stunted palms. Somewhere along the line we have picked up Randolph and Winston again and they have delved into the lovely Fortnum and Mason surprise box and produced petit pois à la Française which are *ravissants*. Randolph has been having little generalship meetings with Liv and Francis ('Just a word with you, dear boy') about the track, about travel procedure, about sending the little car back. He talks late into the night, and late into the night we all hear the little car being towed and whirled about in the desert bowl below our camp in a vain attempt to get it started. In the end it has to be towed most of the way to Agedabia. Poor Francis, John and Jack, no sleep for them.

15TH MARCH

DEW AGAIN, COLD and saturating. Alan's cough is bad and arthritis, with which he has been troubled a good deal in the past, has stiffened up his right leg. He is worrying for fear he will prove a second 'little car' and hold us all up. Liv says we'll put up a tent at Gialo tonight and see if we can't beat this incredible dampness.

I scramble eggs for breakfast which everyone pronounces delicious except Randolph. 'My dear girl,' he says despairingly, 'you've obviously never read Escoffier. It is essential to beat the eggs well first, then add the seasoning. Don't just throw a hunk of butter into a frying-pan full of unbeaten eggs.'

While the eggs are cooking Hank is busy with the bagful of pretty little sand-coloured Jerbels, desert mice, that his and Liv's trapping expedition of the night before has yielded. They found hyena and jackal-tracks which they followed to a camel-carass. Hank says hyena-tracks are easy to identify as the front feet are so much larger than the rear. He is a fountain of information and talks quietly as he works, measuring body, tail, feet and ears, entering every measurement in a ledger. Then both skin and skulls are labelled and tagged. Hank skins his catch with the speed of a good laundress rolling, tucking and putting away socks. The skins are stuffed with cotton and pinned to a tray which is stored in his seven-layered locker-trunk. The skulls, like so many miniature head-hunter trophies, are hung out to dry in the back of Alan's Land Rover.

Catherine asks anxiously if they will smell, but Hank tells her that there is no bacterial action in the desert and that they will be completely without odour.

We are without our navigator today as he is of course on his way back to Agedabia while we are on the south track racing towards Gialo. Liv is navigating by intuition, having done this leg of the journey before. The hummocks and land formations are gone now as are the sage and gorse. Here the world seems to be a platter rather than a globe. Nothing—a complete disc of nothingness. We feel the ancients were not so wrong, the edge of the earth is in sight and at the speed we are going we shall pop over it in no time. And again we think that this is Dali land. We would not be surprised to see a clock, a limp telephone and a lone eyeball appear before us on this pale blond canvas we are crossing. The Churchills' car continues to career off in maverick fashion seeking new routes to the south. When they have given us sufficient lead they stop, and get out the card-table and chairs. Randolph passes the time of day with his philosophy while Winston scouts the terrain or naps under the car.

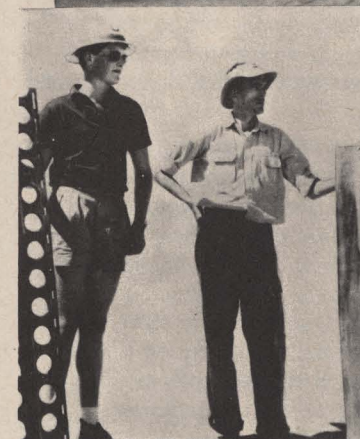
Late in the day Randolph decides to play at being lost. He flags down Alan and Hank who are riding together and calls for a little conference. The other cars, all unaware, disappear over the horizon.

'We have over-shot Gialo. We must instigate rescue procedure,' he says firmly.

Hank, who is an old desert hand, says: 'Well, yes, but let's just follow Pomeroy. We're not in any danger.'

Alan, who has had no desert experience but has a built-in bump of direction, agrees with both of them. 'We're lost, but let's get on with it. We just waste time sitting around here. Give me a drink, Randolph, and let's catch up with Liv. If he doesn't discover his mistake we can always tell him.'

But Randolph will not be out-generalled. 'Goody!' he says. 'We will have a little drink. Get the table,' he orders Winston, 'and get me the binoculars.' Hank and Alan grin and Alan wonders



Familiar sandscapes. Top: Hank Setzer welds a sand track. Left: Winston and Jack Thompson, having retrieved the tracks, watch their car pull away for a mile before its driver finds hard sand on which to stop. Below: In the wake of the sand-tracked cars.





wistfully if any of his three sons could ever be counted on to give him the cheerful service that Winston gives his father, and decides not. Of Alan's sons, Philip is married and not at hand. Duff, who is Winston's age, when home from college, is always just on his way out of the house, and Pom, aged nine, is at the 'in-just-a-minute' stage, which precedes the on-the-way-out stage.

Rescue procedure by daylight consists of sitting still and waiting until someone misses you. Every car is supposed to check on the car behind it every fifteen minutes. A vanishing car is allowed a little time for privacy. If within a reasonable lapse of time it does not reappear a halt is called, and one car is sent back to investigate. Basically, the same procedure goes by night except that the members of the lost car are supposed to find high ground if any is available (and it is amazing how even the flattest-seeming desert has its depressions and swells). The Lost proceed to this spot, both the better to see and to be seen. Each car carries an orange distress flag which should be run up on the bamboo pole which is lashed to the top of each cab. The three civilian cars also carry five-foot box-kites. When one is flown a spotlight can be trained on it and so help the searchers to locate a lost or distressed car. Finally, each vehicle carried a Very pistol, supplied by the Scots; the main body to fire their rockets at twenty minutes after the hour throughout the night and to keep a look-out; the Lost to fire their guns on the hour, and of course keep a look-out too. Our rescue procedure also gives us instructions on how to behave and what precautions to take when lost in the desert. Liv had been thorough.

Numbers have been painted on the doors of all the cars excepting Randolph's. He does not want to mar his for future sale. However, the spectacular flagstaff identifies the Churchill car readily. Our car is No. 1, the Collinses' 2 and the army cars are 4 and 5. When the flag car and No. 2 are missed a halt is called. Liv spies out the land from the top of our cab. The missing cars are not in sight. While we wait he spots a peregrine falcon circling high in the sky. To pass the time he tosses his hat out and we watch the great bird plummet down to investigate. Perhaps it hopes that the hat is a juicy small bird. Within a foot of the ground the peregrine wheels off, and Liv retrieves his hat and gives us our orders. One car will remain and he will go back to look for the stray sheep. And so are Randolph and Co. rescued, but fierce in denial that it is they who have strayed. Another little conference is held and Randolph declares that he is beetling off westward on his own. Liv shrugs. For the moment it is all right. We are in known desert. The oasis is not far off, although invisible, and there's the tall rig of a seismic camp somewhere in front of us. In another day when we have left such things behind we must travel close together. Separation in that desert can end the adventure once and for all.

Randolph has a homing instinct. Without a brush or clump to guide himself with he has found Gialo which he has entered, conversing with the school-teacher and drinking tea with the Mudir. He has also found the seismic camp where he has delighted the men and outraged the manager. He has invited ten men to dine with us tomorrow night and instructed them to bring ice and four loaves of toast, hot and crisp, to serve with his pâté. He has also found his way to our own camp on the Gialo-Kufra track. The tent is pitched and the bed-rolls are out. Liv and Hank have gone to the oasis to set traps. Randolph and Winston give us the news and race off for an evening with the geologists. On our own we have a quiet supper, and as darkness falls we assume the Churchills to be dining at the rig, and pack away the kitchen. Late in the night the flag car roars into camp and we are berated for not having hot soup ready in language Randolph's Nanny never taught him. So the kitchen is unpacked, and Winston and I cook up a second supper. We have a difficult

passenger in this great creature with his commanding presence, his brilliant wit and rough manners. It has reached the point where we relish the peaceful moments when he is sleeping and yet we all recognize his sweetness and find that he can be amusing and companionable. In the midst of the bruha-ha tonight he takes me aside in one of his 'may-I-have-a-tiny-word-with-you' confidences, walks into the darkness and tells me that he'd been touched by my concern for his health, and that he is enjoying the trip and already feels better.

'But pills,' he says, 'what an impossible, American idea. I never take pills.'

#### 16TH MARCH

FRANCIS DID NOT turn up in the evening as we had hoped he would. We heard a motor in the night and fired off a Very pistol at eleven o'clock. Liv ran up the kite and we spotlighted it. When Francis and John Ferguson turned up this morning they said that they had gone south on the track forty miles, passing us within a few miles without seeing a sign of us. This flat-seeming camp-site is in fact in a depression. We had not seen the flare they shot off at eight o'clock and they had not seen ours. When Catherine and I went for an early morning ride both camp and its high-flying kite disappeared within three kilometres.

Francis reports that far from getting rid of the radio, which none of us really wanted on the trip, Colonel O'Lone has promised to arrange with the R.A.F. to fly it down to Kufra to us. Francis and Liv are gloomy at the prospect for we will have to fit this extra five hundred pounds and a man into our already overloaded cars.

Alan has decided to leave the expedition. Despite the tent he cannot bend his knee now, and in the night he coughed more than he slept. He and Liv are going to the rig to pay their respects and see when the next supply plane is coming down. They will fill up on drinking-water, tighten up some bolts, drill holes in the roof of Alan's car for the spotlight which has not yet been mounted, and radio Benghazi our revised schedule since we have been delayed so much.

Catherine dispiritedly sorts through the Collinses' suitcase, making up a bundle of things for Alan to take back. She keeps his heavy equipment. He won't need it in Benghazi or Rome or Tunis where he may go to visit friends, but if he recovers he may fly down to Chad to rejoin the expedition. He is a methodical man and at the same time a dreamer. Realistic as his action is, she knows how hard it is to give up the dream.

In the afternoon Catherine and I are invited to the oil camp to bathe. The bathroom is a trailer equipped with showers and basins. Other trailers are mess, kitchen and workshop, and in the circle about are the sleeping-tents with double roofs, mosquito-netting and real beds. In the bath trailer we open all of the windows, letting a cool breeze in and privacy out. There are gallons of hot water and piles of white towels. We bathe and perfume ourselves and wash our hair and clothes, taking a bag of fresh laundry back to camp to hang on a line strung from No. 2 car. We pay marked inattention to the soldiers' giggles. They will just have to get used to females in camp.

The oil people have offered hospitality to Alan and Randolph, who says that since pâté and caviar are finished he may as well go home. A supply plane is due at the rig Monday and will fly them back to Benghazi. Winston will keep the Churchill Land Rover and come along with us.

'He's a good boy,' says Randolph. 'He's steady on parade. But I spent sixty pounds on tulips this year. It would be a waste not to see them come up. Besides, my little spaniel is in whelp. Very

irresponsible of me to go away from home for six weeks.'

Only five of the oil men come for dinner. Randolph has countermanded the other invitations saying firmly, 'Five is enough and bring your own plates and forks.'

At least he did not put off bearded André whom we all love. André has taken care of the men and their problems, invited the women to bathe and conversed fearlessly with Randolph. We don't know what they conversed about, for Randolph set up his two camp-chairs in the desert well away from camp and the two big men sat there, on the shore of a mirage of blue water, a bottle of Scotch and one of Drambuie on the sand beside them. Even from a distance it was apparent that André was no mere listener. André is a Frenchman, from the Pyrenees. He told us that he commanded a battery of horse artillery during the last war and was taken prisoner on horseback. We think it must have been a singular honour.

The last of Randolph's pâté is delectable served with the crisp

#### REAL & IMAGINARY (from page 2)

to Odin's sacred oak. He convinced the people instead to adorn fir trees in their homes in tribute to the Christ Child.

Although Christ's birthday was celebrated on various dates as early as the third century, its observance wasn't sanctioned officially until a century later. Until then, Church fathers withheld their blessing because they feared the occasion would be tied in with pagan festivals.

Finally, to satisfy growing Christian desire, Pope Julius I authorized an investigation to determine Christ's probable birth-date. This led to the selection of Dec. 25. On that date in 353 A.D., the feast of the Nativity was first observed in Rome.

#### INVENTORY

Four be the things I am wiser to know:  
Idleness, sorrow, a friend, and a foe.  
Four be the things I'd been better without:  
Love, curiosity, freckles, and doubt.  
Three be the things I shall never attain:  
Envy, content, and sufficient champagne.  
Three be the things I shall have till I die:  
Laughter and hope and a sock in the eye.

—Dorothy Parker

toast which our guests have brought us. For dinner we have green turtle soup, also from Fortnum and Mason. It is flavoured with sherry and we tell Randolph that he is a great gourmet, with which he readily agrees. We also have tamales, hot chili beans, beet salad and whisky. André holds a lantern for the women to do the dishes and Randolph complains that American women demand too much attention and that Frenchmen give them too much. An Englishman, now, knows how to treat women! Catherine thinks she has earned the Victoria Cross for not throwing the dish-water at him.

Late in the night our guests climb into their Rover, packing in Alan and Randolph and their gear. Randolph has kissed both of us and promised me a spaniel pup. Catherine watches the lights of the car as it draws away. Nothing diminishes in the desert, but suddenly disappears. When that has happened she walks weeping in its wake with Liv to comfort her. (Continued)

Exchanging Christmas cards is a fairly recent custom. It began in England in the 1840's—the exact date is in dispute. The first sender also is a source of argument. At least four persons, including a 16-year-old artist, are credited with being first.

Christmas cards were introduced in the U.S. by Louis Prang, a German immigrant who settled in Roxbury, Mass. Known as the "father of the American Christmas card," Prang printed his first one in 1873. By 1881, he was turning out five million yule cards a year.

It was in the 1870's that nostalgic winter scenes by the famed Currier and Ives became highly popular as Christmas card illustrations. Even today, Currier and Ives Christmas cards are perennial best sellers, according to greeting card firms. One business organization alone, Nationwide Mutual Insurance of Columbus, Ohio, sends out 200,000 Currier and Ives Christmas cards each year.

The No. 1 Christmas favorite of children, of course, is jolly, old Santa Claus. The original Santa Claus was St. Nicholas, a fourth century bishop famous in his life-

time for his great generosity, especially to children.

Legend has it that St. Nicholas secretly tossed bags of gold into the home of three dowry-less girls when they reached marriageable age. On one of these missions, the bag fell into a stocking hung near the chimney to dry. And so began the custom of hanging stockings on Christmas Eve.



**THE OLD PROFESSOR SAYS:** It's a pretty good world we live in when you consider that the only inexcusable thing in it is the weather.



## CYCLES & BELLS (from page 16)

I stood entranced at the grandeur of the view when a typical Tennessee mountaineer came along clad in blue jeans, home knit galluses and a calico shirt. He took a cap and ball muzzle loading squirrel rifle off his shoulder and stopped beside me. In my best mountain style, I said "Howdy." He replied "Howdy." For five minutes he stood beside me looking down across the val-

ley. Then he said slowly,

"Young feller, there jist has got to be a God."

I looked at the magnificent, breathtaking, lump-in-the-throat-making landscape and realized that I had heard the sermon of my life. He was right. There just has got to be a God. There is no other way to account for that great picture.

He had preached me a sermon that had driven all doubts and fears out of my mind forever. He was the best preacher I ever listened to, or to whom I shall ever listen, because from that moment there has never been a doubt in my mind that there is a real and personal God. And there never will be any doubt.

ROE FULKERSON

# CHAPTER ACTIVITIES

**ALPHA, University of Illinois** — Alpha Chapter of Eta Kappa Nu remained an active chapter during the spring semester of 1966. Alpha Chapter's largest activity was its participation in Engineering Open House. Our projects consisted of an information booth with free coffee and manned by an HKN member and a faculty member, a museum of old EE equipment, and a "theater" in which films of the U.S. Space Walk, the Russian Space Walk, and the development of the XB-70 were shown. We also supplied coffee and doughnuts for the work crews setting up projects for open house.

**BETA, Purdue University** — An important accomplishment of Beta Chapter this spring was the updating of the EE graduation class picture display. Until recently, this has been behind several years. The chapter would like to make this display as complete as possible; if any alumni of the chapter has not submitted their picture or know of a Purdue EE graduate who has not, he is urged to send a wallet sized picture to Professor L. A. Kramer, c/o Electrical Engineering Department, Purdue University.

**GAMMA, The Ohio State University** — Gamma Chapter of Eta Kappa Nu at The Ohio State University is again in charge of editing the Newsletter as a service to the Department of Electrical Engineering. The Newsletter is an annual publication to the alumni informing them of the developments and achievements of the Department in the academic year 1965.

Brother Tom Thomas was elected as the outstanding Electrical Engineer of the Gamma Chapter of Eta Kappa Nu. He has entered the National competition of the most outstanding electrical engineer of Eta Kappa Nu.

**CHI, Lehigh University** — The goal of Chi Chapter of Eta Kappa Nu has been to render the greatest possible service and assistance to the depart-

ment of electrical engineering at Lehigh. This has taken many forms, ranging from the carrying out of requested improvements to self-inspired group activities in the best interests of the department. In addition, a reading room has been maintained by the members of Eta Kappa Nu. Recent magazines and periodicals pertaining to electronics and electrical engineering are kept in large supply. Plans are now underway for the beginning of a tutorial program for the benefit of sophomore and junior electrical engineering majors.

**BETA ZETA, New York University** — Beta Zeta chapter assisted the EE Dept. at NYU by providing guides for Engineering Day and similar activities. In particular, members gave individual tours of the department to prospective freshmen in the hope of acquainting them with EE fields and giving advice on a more personal basis than is normally allowable.

The highlight of the semester was the initiation banquet, held at the Stuyvesant Yacht Club on City Island. The banquet was held in conjunction with the N.Y. Epsilon Chapter of Tau Beta Pi. It is hoped to expand this, so that eventually all Engineering Honoraries will be represented. This plan has several advantages, notably its greater attraction to faculty and administration.

**BETA LAMBDA, Virginia Polytechnic Institute** — The Beta Lambda Chapter has remained very active during the last two quarters. New officers were recently elected, and former officers are presently working with their successors in matters concerning Beta Lambda Chapter.

Initiates of winter quarter were instrumental in the installation of a bulletin board in the main hallway of the Electrical Engineering department, Patton Hall. This board contains pictures of all E.E. professors and a brief summary of their fields of interest in hopes of better acquainting new students with the faculty.

**BETA NU, Rensselaer Polytechnic Institute** — Beta Nu chapter initiated a total of 38 new undergraduate members during the past year, bringing the total membership to 73. Our major activity was an orientation program held for the freshmen and sophomores in which the students could informally meet and speak with the E.E. faculty about the various aspects of the profession. A large turnout was had for the program. A demonstration of E.E. work presented on parents' weekend with the aid of several HKN members proved to be a popular exhibit with the visitors.

**BETA OMICRON, Marquette University** — For the Engineering Open House held at Marquette on March 12, the Chapter decided to offer their services and time to the Electrical Engineering Department rather than work on a HKN exhibit by themselves. Many of our members were chosen to be chairmen of the various lab activities, and it was remarked that the Electrical Engineering displays were the finest they have had in years.

Chapter members also continued their participation in the help sessions for freshmen and sophomores which is sponsored by all the honor societies. The evening division members also held help sessions at night for the lower classmen of the evening division.

**GAMMA ALPHA, Manhattan College** — In order to fulfill its duties as a fraternal organization spreading interest and excellence in electrical engineering, the Gamma Alpha chapter at Manhattan College has set its sights on a diversified program of student aid. Free remedial classes have been initiated at all undergraduate levels providing instruction in everything from elementary calculus to systems and networks analysis. In close cooperation with the electrical engineering department some lab techniques, procedures, and equipment have been checked and improvements made. For the future, a color movie on the astro-

naut's walk in space has been scheduled and organizational discussions about a dinner-dance are under way.

**GAMMA GAMMA, Clarkson College of Technology** — This year, we at Gamma Gamma have been engaged in organizing a project to raise money for our treasury. If all goes well, next Fall we should be selling review books to the sophomores, juniors, and seniors.

**GAMMA ZETA, Michigan State University** — Gamma Zeta Chapter of Eta Kappa Nu at Michigan State University is proud of its accomplishments this year. We have tried to provide programs that would appeal to all students of electrical engineering and even to students of other branches of engineering. We are happy to report that not only have our efforts been welcomed and appreciated, but some of what we have begun will be permanently a part of engineering educational policy here at Michigan State University.

**GAMMA THETA, University of Missouri** — Gamma Theta Chapter sold laboratory insurance to provide money for a scholarship of the amount of two hundred dollars. The recipient was Jim McGinnis, an electrical engineering junior. Work was continued and nearly completed on a Departmental Directory Showcase with a picture of each faculty member and his corresponding office number.

**GAMMA IOTA, University of Kansas** — The chapter, as a part of an initiation program, constructed a semiconductor display for the engineering building.

All new electrical engineers upon enrolling are presented with the HKN "A Worthwhile Goal" to help acquaint them with HKN. Another feature to stimulate interest is the showing of electrical safety films throughout the year by HKN members.

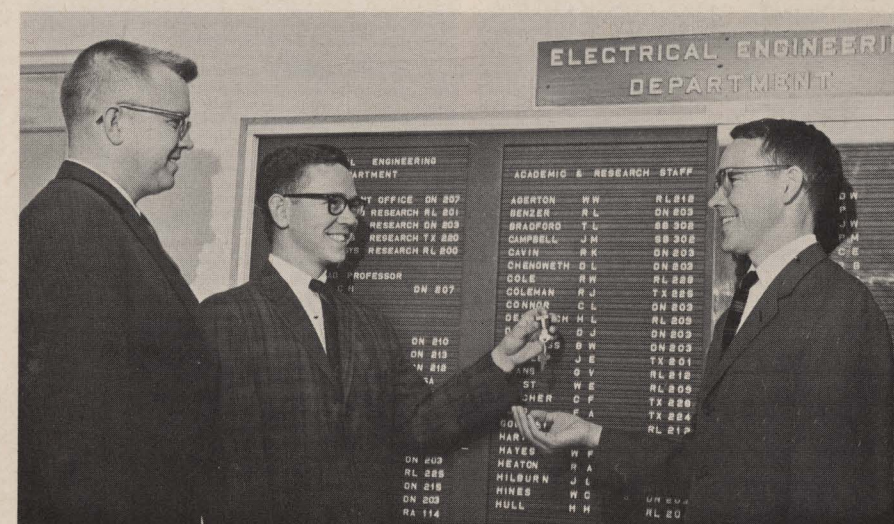
**GAMMA CHI, New Mexico State University** — Gamma Chi Chapter moved ahead on its plans to initiate a wife's auxiliary. Many of the wives have already worked on posters, picnics, and banquets for Eta Kappa Nu.

Many men of Gamma Chi donated blood for an ailing professor in the Electrical Engineering Dept. We were all grateful when Dr. Lucky recovered and returned to his teaching duties.

Eighteen of our Brothers were graduated this June and August — a record number for this chapter.

**GAMMA TAU, North Dakota State University** — During the past year, the Gamma Tau chapter of Eta Kappa Nu, has been busy working on a logics board project, and also an amplifier project.

**GAMMA XI, University of Maryland** — James Kenney, who will graduate this June, constructed a brass replica of the bridge, mounted in a



Members of Xi chapter at Auburn University recently presented to their electrical engineering department a nifty directory for academic and research personnel. The modern board, featuring snap-out panels for easy arrangement, was designed by Dr. J. L. Lowry, left, and built by students. Making the presentation to Dr. Charles H. Holmes, head professor, is Terry McPherson of Montgomery, center, president of the chapter.

mahogany display case against a scarlet and blue background. It is on display in the Engineering building at the University of Maryland.



**DELTA NU, University of Alabama** — This spring semester at the University of Alabama, the Delta Nu Chapter of Eta Kappa Nu initiated thirteen undergraduate new members.

The pledges were required to polish their own brass emblems and to wear them on the appointed week.

**DELTA ETA, University of Massachusetts** — On April 21, 1966, Delta Eta Chapter initiated three new members into Eta Kappa Nu, two juniors and one professional member. The professional member was Professor Joseph W. Langford of the E.E. Department. The same evening our annual Spring banquet was held in honor of the new members with students and faculty members attending.

At the banquet, the chapter's fourth annual "Outstanding Senior Award" was presented to James E. Poulin, a member of Delta Eta Chapter. The speaker for the evening was Dr. Charles E. Hutchinson of the E.E. Department who gave a talk on continuing engineering education.

**DELTA KAPPA, University of Maine** — Because of the high attendance of the HKN tutoring sessions in EE 1 during the fall semester, additional members were assigned to supplement the tutoring group on nights before the EE 1 & 2 tests. Also during the fall semester, it was decided that the reading room at the EE Building (Barrows Hall) should be reorganized. The textbooks were arranged in alphabetical order by authors, and a cross index file arranged by subject division. The pamphlet and textbook shelves were labeled for quick reference, and card holders were placed before the magazine slots for identification cards.

**EPSILON GAMMA, University of Toledo** — Epsilon Gamma Chapter of Eta Kappa Nu has taken in thirteen new members, including three faculty members and two members from N.A.S.A.

The annual smoker for prospective members was held on April 15, 1966, and the election of the new members followed.

**EPSILON THETA, California State College** — Activities of Epsilon Theta Chapter of Eta Kappa Nu for the fall semester of 1965 started with a Smoker on Nov. 20. At the Smoker prospective pledges of Eta Kappa Nu were familiarized with some of the traditions and goals of Eta Kappa Nu.

On Dec. 11 initiation ceremonies were held. Fifteen new members were initiated, which was a new high for Epsilon Theta. Mr. Tom Rothwell, then Western Regional Director, spoke to the new members on the history of Eta Kappa Nu and the significance of belonging to an honor society.

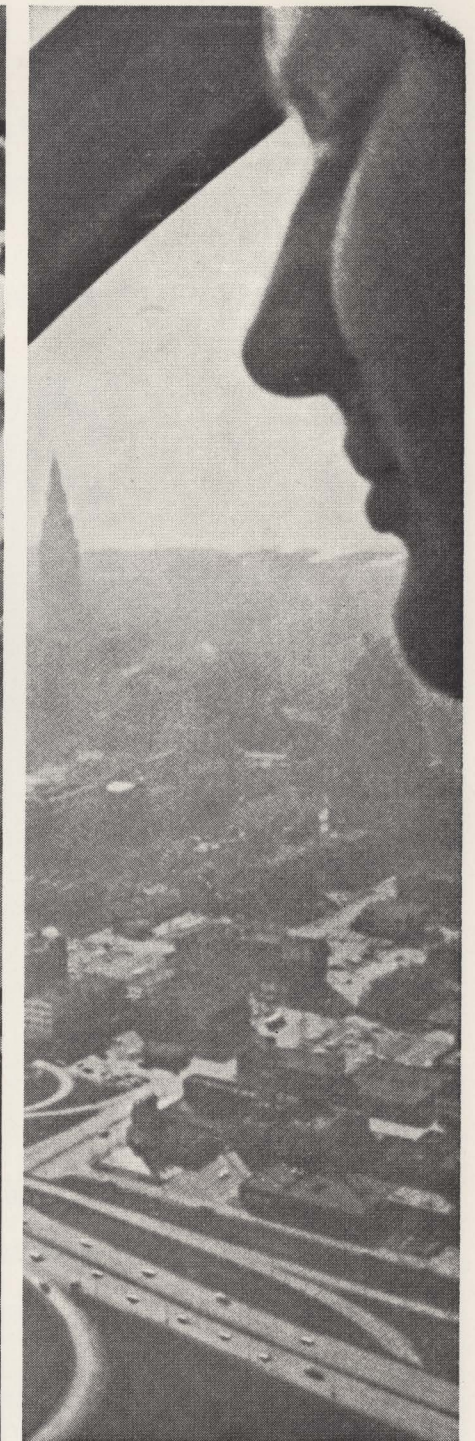


## CHAPTER DIRECTORY

School	Chapter	City	State	School	Chapter	City	State
<b>A</b> Air Force Inst. of Tech.	Delta Xi	Wright-Patterson AFB, Ohio		Minnesota, U. of	Omicron	Minneapolis	
Alabama, Univ. of	Delta Nu	Tuscaloosa, Ala.		Mississippi State U.	Gamma Omega	State College	
Arizona State U.	Epsilon Beta	Tempe, Ariz.		Missouri Sch. of Mines and Met.	Gamma Theta	Holla, Mo.	
Arkansas, U. of	Gamma Phi	Fayetteville		Missouri, U. of	Iota	Columbia	
Auburn U.	Xi	Auburn, Ala.		<b>N</b> Nebraska, U. of	Beta Psi	Lincoln, Neb.	
<b>B</b> Bradley U.	Delta Upsilon	Peoria, Ill.		Newark College of Engr.	Gamma Kappa	Newark, N.J.	
Brooklyn Polytech. Inst.	Beta Beta	Brooklyn		New Mexico State U.	Gamma Chi	State College	
<b>C</b> Calif. State Coll.—Long Beach	Epsilon Theta	Long Beach		New Mexico, U. of	Delta Omicron	Albuquerque	
California, U. of	Mu	Berkeley		New York, The City College of	Beta Pi	New York	
Calif., Univ. of Southern	Upsilon	Los Angeles		New York U.	Beta Zeta	New York 53	
Carnegie Inst. of Tech.	Sigma	Pittsburgh		North Carolina State College	Beta Eta	Raleigh	
Case Inst. of Tech.	Zeta	Cleveland		North Dakota State U.	Gamma Tau	Fargo	
Cincinnati, U. of	Tau	Cincinnati, Ohio		North Dakota, U. of	Delta Rho	Grand Forks	
Clarkson College of Tech.	Gamma Gamma	Potsdam, N.Y.		Northeastern U.	Gamma Beta	Boston	
Colorado State U.	Delta Pi	Fort Collins, Colo.		Northwestern Tech. Inst.	Beta Tau	Evanston, Ill.	
Colorado, U. of	Rho	Boulder, Colo.		Notre Dame, U. of	Delta Sigma	South Bend, Ind.	
Columbia U.	Gamma Lambda	New York 27		<b>O</b> Ohio State U.	Gamma	Columbus	
Connecticut, U. of	Beta Omega	Storrs, Conn.		Ohio U.	Delta Epsilon	Athens	
Cooper Union	Delta Chi	New York 3		Oklahoma State U.	Omega	Stillwater	
Cornell U.	Kappa	Ithaca, N.Y.		Oklahoma U.	Beta Xi	Norman	
<b>D</b> Denver, U. of	Delta Delta	Denver, Colo.		Oregon State Coll.	Pi	Corvallis	
Detroit, U. of	Beta Sigma	Detroit, Mich.		<b>P</b> Pennsylvania State U.	Epsilon	University Park	
Drexel Inst. of Tech.	Beta Alpha	Philadelphia		Pennsylvania, U. of	Lambda	Philadelphia	
Duke U.	Delta Lambda	Durham, N.C.		Pittsburgh, U. of	Beta Delta	Pittsburgh, Pa.	
<b>F</b> Fenn College	Epsilon Alpha	Cleveland		Pratt Inst.	Delta Theta	Brooklyn 5, N.Y.	
<b>G</b> Georgia Inst. of Tech.	Beta Mu	Atlanta, Ga.		Purdue U.	Beta	W. Lafayette, Ind.	
<b>H</b> Hawaii, U. of	Delta Omega	Honolulu		<b>R</b> Rensselaer Polytech. Inst.	Beta Nu	Troy, N.Y.	
Houston U.	Epsilon Epsilon	Houston, Texas		Rutgers U.	Gamma Epsilon	New Brunswick, N.J.	
<b>I</b> Illinois Inst. of Tech.	Delta	Chicago 16		Rose Polytech. Inst.	Epsilon Eta	Terre Haute, Ind.	
Illinois, U. of	Alpha	Urbana, Ill.		<b>S</b> St. Louis U.	Delta Psi	St. Louis, Mo.	
Iowa State College	Nu	Ames, Iowa		San Jose St. Coll.	Epsilon Iota	San Jose, Calif.	
Iowa State, U. of	Beta Iota	Iowa City		South Carolina, U. of	Delta Phi	Columbia, S.C.	
<b>J</b> John Hopkins U.	Gamma Upsilon	Baltimore, Md.		South Dakota Sch. of Mines	Beta Chi	Rapid City, S.D.	
<b>K</b> Kansas State U.	Beta Kappa	Manhattan, Kans.		South Dakota State Univ.	Gamma Rho	Brookings, S.D.	
Kansas, U. of	Gamma Iota	Lawrence, Kans.		Southern Methodist U.	Gamma	Dallas, Texas	
Kentucky, U. of	Beta Upsilon	Lexington, Ky.		Syracuse U.	Omicron	Syracuse, N.Y.	
<b>L</b> Lafayette College	Gamma Psi	Easton, Pa.		<b>T</b> Tennessee, U. of	Beta Phi	Knoxville	
Lamar State Coll. of Tech.	Delta Beta	Beaumont, Texas		Texas A & M	Gamma Mu	College Station, Tex.	
Lehigh U.	Chi	Bethlehem, Pa.		Texas Tech. Coll.	Gamma Nu	Lubbock	
Louisiana Polytech. Inst.	Delta Gamma	Ruston, La.		Texas, U. of	Psi	Austin	
Louisiana, Southwestern U. of	Delta Tau	Lafayette		Toledo, U. of	Epsilon Gamma	Toledo, Ohio	
Louisiana State U.	Delta Iota	Baton Rouge		Tufts U.	Epsilon Delta	Medford, Mass.	
Lowell Tech. Inst.	Epsilon Zeta	Lowell, Mass.		<b>U</b> Union College (inactive)			
<b>M</b> Maine, U. of	Delta Kappa	Orono, Maine		Utah, U. of	Gamma Sigma	Salt Lake City, Utah	
Manhattan College	Gamma Alpha	New York 71		<b>V</b> Villanova U.	Delta Mu	Villanova, Pa.	
Marquette U.	Beta Omicron	Milwaukee, Wis.		Virginia Polytech. Inst.	Beta Lambda	Blacksburg, Va.	
Maryland, U. of	Gamma Xi	College Park, Md.		Virginia, U. of	Gamma Pi	Charlottesville, Va.	
Massachusetts Inst. of Tech.	Beta Theta	Cambridge, Mass.		<b>W</b> Washington U.	Delta Zeta	St. Louis, Mo.	
Massachusetts, U. of	Delta Eta	Amherst		Wayne State U.	Delta Alpha	Detroit, Mich.	
Miami, U. of	Epsilon Kappa	Miami, Fla.		West Virginia U.	Beta Rho	Morgantown, Va.	
Michigan State U.	Gamma Zeta	East Lansing, Mich.		Wisconsin, U. of	Theta	Madison, Wis.	
Michigan Tech.	Beta Gamma	Houghton		Worcester Polytech. Inst.	Gamma Delta	Worcester, Mass.	
Michigan, U. of	Beta Epsilon	Ann Arbor					

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