Pete Drobach has a knack for getting to the root of a problem.

High school students John Magish and John Ripley would be the first to agree.

They're both student members of a "big brother" program that Pete sponsors. Each week, they spend several hours of their own time helping less advanced classmates with their studies.

Pete is more than a sponsor. He's also a consultant—particularly when they're stumped by the logic of a tough "new math" problem.

But when Pete graduated from Rutgers in 1964, it wasn't these youngsters with their homework problems that brought him to General Electric. It was the chance to help people in industry solve tough technical problems. A career in technical marketing at General Electric gave him the opportunity.

Today, Pete's an application engineer in steel mill drives and automation systems. His ideas on how to apply products from many of GE's 160 separate businesses enable his customers to improve the efficiency and productivity of their plants.

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GENERAL ELECTRIC
AN EQUAL OPPORTUNITY EMPLOYER (M/F)
Old Bossy may have worn a cowbell to signal her whereabouts, but soon scientists will be able to keep up with animals and study the complete migratory habits of birds by simply tying tiny transmitters to all types of moving wildfowl.

A new satellite system is being developed that will keep its eye on wildlife activities so thoroughly that man will at last find out what a giant sea turtle really does with its time.

The electronic system developed by engineers at Radiation Incorporated, Melbourne, Florida, a subsidiary of Harris-Intertype Corp., is called the Interrogation, Recording and Location System (IRLS). The initial experimental use begins with the Nimbus-B Satellite launching scheduled for 1968.

This paves the way for the Nimbus-D and the Advanced IRLS, which by 1970 may turn out to be man's best snoop when it comes to discovering precise facts about wildlife activities.

For example, the Advanced IRLS may give scientists exact information about the life cycle and migratory habits of those giant sea turtles found in the area between the West Indies and the Ascension Islands off the coast of Africa. With the transmitter attached, the turtle will "broadcast" its movements and activities. The information would be picked up by the orbiting satellite, then would bounce to a pickup station, so the turtle would be under constant surveillance.

Still later systems — if and when they are developed — wouldn't even need the transmitters to keep up their busy "moving-migrating-flying" charges; their sensors would be able to distinguish between living things on earth by the radiation they give off.

(Continued on Page 8)

NATIONAL DIRECTORY

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Chicago Regional Visitaton

By ROBERT J. MILLER

The second ETA KAPPA NU Central Regional Meeting was held in the Chicago area and organized by the Chicago Alumni Chapter. The meeting took place at the Teletype Corporation in Skokie, Illinois, a suburb of Chicago. The meeting was attended by Dr. W. P. Smith, President of HKN, J. E. Farley, Vice-President HKN, H. H. Slocum, Member of the Committee, three members of the Chicago Alumni Chapter and twenty students and faculty advisors from nine universities in the East Central Region. The following universities were represented: Bradley University, Illinois Institute of Technology, University of Illinois, Iowa State University, University of Minnesota, Northwestern University, University of Notre Dame, Purdue University, Rose Polytechnic Institute.

Following a 9:00 a.m. registration and welcoming of delegates, the meeting was convened by Dr. John Leary, President of the Chicago Alumni Chapter, who outlined the agenda for the day. The day's activities were as follows:

1. Tutoring undergraduate EE's, with or without participation of other organizations such as Tau Beta Pi.
2. Sponsor of "Outstanding Freshman Project" award.
3. Award to outstanding EE Senior.
4. Preparation of "Teacher Rating Form" to be completed by the student with appraisal of strong and weak points.
5. Recommendation of award "Outstanding Teacher Of The Year."
6. Parents day demonstration of lab activities.

The Committee was discussed by H. H. Slocum, who outlined events leading to the preparation of the 1954 movie "Engineering - A Career For Tomorrow." The desirability of updating the film was with a new version incorporating significant technical changes. The film's success is in progress and the level of financial assistance is improved because of recent co-sponsorship and assistance provided by IEEE.

A very interesting and informative luncheon address was given by Mr. Roger Kich, Vice-President, Research and Development of the Teletype Corporation, who described how management views the engineering profession and indicated to the new engineer those attributes and abilities that he should bring to this new organization.

Following a very interesting tour of the Teletype Corporation facilities the meeting adjourned at 3:30 p.m.

Delegates are shown participating in actual demonstrations of Teletype equipment. Mr. R. A. Nefeldt from Equipment Exhibit Department at Teletype is shown answering questions about the equipment.

During the problem and discussion period, the delegates had a chance to discuss various topics pertaining to chapter activities.

Seated on the panel from left to right are, Mr. Jack Farley, Vice-President of National HKN, Dean William P. Smith, President of National HKN, Mr. John Leary, President of Chicago Alumni Chapter HKN, Mr. John Leary, President of Chicago Alumni Chapter HKN.

Mr. Roger Kich, Vice-President of Research and Development of Teletype Corporation is shown giving the after dinner speech which related to the outlook and relationship of industry and the new engineer.

Delegates are shown participating in actual demonstrations of Teletype equipment. Mr. R. A. Nefeldt from Equipment Exhibit Department at Teletype is shown answering questions about the equipment.

Mr. B. B. Willmott, R & D Engineer at Teletype Corporation, is shown demonstrating MOS thin-film circuitry used at Teletype Corporation. The delegates could see the evolution and steps involved in development and manufacture of thin-film devices.

Mr. Bob Miller, Treasurer of Chicago Alumni Chapter of HKN and Senior Engineer in Test Set Design at Teletype Corporation is shown welcoming the delegates to the meeting hosted by Teletype Corporation.
Dear Friends,

Knowing how great was my interest in railroads when a boy you will not be surprised to know I was attracted to a book I ran across Saturday morning at the Urbana Library. One incident which shows something about the early railroads is the account written by Horace Greeley for the Tribune regarding his experience on a lecture tour in Indiana in October, 1853.

Greeley had given his lecture on Temperance at Lafayette and was to go by train to LaPorte, Indiana, for the next lecture. He went to the station in the early morning but could get no definite information as to just when the train would leave. After waiting several hours he learned the train he wanted used another station in Lafayette. He got to that station just in time to see the smoke of the departing train. So he had to remain and take the train the next day.

That day he boarded the train which to him seemed quite a combination of rolling stock. It was scheduled to start at 10 but actually did not move until noon. Five cars were packed with hogs, five with wheat, two with lumber, five cars with livestock and incendiaries returning from a fair, and three cattle-cars loaded with people. The engine looked old and it had trouble moving the train.

Near Tipppecanoe Creek Battlefield the locomotive ran off the rails and it took quite a time to get the wheels back on the rails. Then the supply of wood and water for the locomotive was used up. To get more the engine was detached from the train and was run to the next station where wood and water could be obtained. This took two hours.

But after its return as they were coupling it to the train a part of the boiler blew out making the engine inoperative. The engineer thought there was a locomotive at a place 40 miles ahead. So he got a handcar and proposed going with it to get the locomotive. The conductor decided to use a handcar and return to Lafayette to get an engine that would pull the train back to Lafayette. Greeley didn’t want to stay longer in that place so urged the engineer to go on with his plan. And the engineer seeing how anxious Greeley was to get to Laporte offered to let Greeley ride the handcar with him. Some others also wanted to go and 7 men crowded on the little car which Greeley said “was the size of a wheelbarrow and a half.” The men took turns pumping the car. The first 5 miles took 25 minutes and the first 10 miles took an hour. It took from 7 P.M. until midnight to reach the place where the engine was supposed to be but when they reached that place they found the engine had been moved the other direction to Michigan City.

So what could Greeley do? They still were a long distance from LaPorte. Seeing how anxious Greeley was to get there the engineer offered to let him take the handcar and Greeley hired two men to pump the car because he had awakened the people in every house in that town trying in vain to find a horse that could be hired.

So all the rest of that night the handcar was pumped along and Greeley reached LaPorte at 9 A.M. and gave his lecture that afternoon on the subject of the evils of dram taking.

Such was what might be expected in those days in going by train. Greeley got there however and he tells of the interest he had in seeing wild geese, a great heron, many wild animals scared in the night by the handcar, five prairie fires, etc.

That railroad goes through Crawfordsville where Wallace lived. It is supposed that he wrote some chapters of Ben Hur while on train journeys on that railroad.

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EYE ON THE SPARROW

The flight pattern of birds, the fishy side of a fish’s underwater life far from the eyes of man—all could be picked up and studied carefully.

Similar satellite systems, including Eros, will make information readily available on conditions inside live volcanoes. These “eyes” in space will be able to “study” inaccessible deserts, glaciers and dense jungle areas—then report precisely on the conditions in an exact spot over a period of time. Man will no longer have to be there in person, for these advanced data collection systems will be highly useful to any scientist needing extensive information from any area which normally would be remote to humans.

In addition to tracking animals, spotting developing volcanoes and surveying remote areas, it will be possible for the satellite system to detect forest fires, provide iceberg warnings and help maintain inventories of coal, timber, water, mineral and cropland resources. More significantly, the Advanced IRLS will contribute to truly accurate long range weather forecasts.

While both the earlier and advanced systems are capable of collecting vast stores of information, the primary difference according to Radiation Incorporated is the Advanced IRLS’s greater capacity and flexibility.

For instance, the IRLS system, which will begin with the launching of the Nimbus-B, can make 20 contacts—or interrogations—during a single polar orbit. But the Advanced IRLS, which will be ready about 1970, will be able to make 270 contacts per orbit—and will be flexible enough to operate with several different types of remote information stations. The Advanced IRLS will be “talking” to drifting ocean buoys, land weather stations, free floating balloons and aircraft.

Platforms for the first generation IRLS generally contain medium-capacity sensors and are attached to ocean buoys. They will also be used with the Advanced IRLS, according to Radiation Incorporated, but there will be smaller lighter platforms for balloon transport and a heavier type. And, of course, the capacity will be much higher.

Each platform for the first IRLS will have a 166-word capacity but the larger platforms for Advanced IRLS will be able to handle up to 840 words—which is pretty gabby for a satellite in anybody’s book!

When it begins, the IRLS circuitry on the Nimbus satellite—very much like a hitch-hiker in somebody’s car—will be commanded by the Ground Data Collection Center at the beginning of each of its polar orbits to “question” different platforms at specific times. Then when the satellite clock time matches the programmed time, the satellite will send an address code to the platform.

The platform then acknowledges the address and transmits its data to the satellite—data on such environmental factors as water salinity and temperature.

Exact location of each platform is calculated by computer even when the platform is constantly moving. The sensor data is coordinated with the time of questioning and the satellite-to-platform “range” for tracking purposes and is stored in the IRLS satellite Data Memory.

When the satellite again passes over the Ground Data Collection Center, material collected from all the “questioned” platforms is received by the ground center. The information is separated, then forwarded to appropriate users.

The “Sea Turtle” data may go to an eagerly waiting naturalist. “Weather Conditions In Arctic Ocean At 4 A.M.” to the weather man, safe and warm in his bureau...and then all the information goes to help the most curious animal of all: Man.

THE NEXT EIGHT PAGES

Presented here is the sixth in a series of special BRIDGE supplements. This one, involving the dimensions of the human spirit, is in observance of the year-end holiday season. The cup on the first page is a detail from the painting Still Life by Zurbaran, courtesy the PRADO, Madrid. The painting on the second page is by Delfsens, 1964. The poetry on the third page is 1966 by Tom Jones and Harvey Schmidt, used by permission of Chappell & Co., NYC. The paintings on the third page courtesy the General Electric Co. The painting on the fourth page is Spenser’s Teardrop.

And He said unto Peter, The cup which my Father hath given me, shall I not drink it?
The Cup Of Life

I. Charles Lounsbury, being of sound mind and disposing memory, do hereby make and publish this, my last will and testament, in order as justly as may be to distribute my interest in the world among succeeding men.

I give to good fathers and mothers, in trust for their children, all good little words of praise and encouragement, and all quaint pet names and endearments, and I charge said parents to use them justly and generously, as the needs of their children may require.

I leave to children inclusively, but only for the term of their childhood, all and every, the flowers of the fields, and the blossoms of the woods, with the right to play among them freely according to the customs of children, warning them at the same time against thistles and thorns. And I devise to children the banks of the brooks, the golden sands beneath the waters thereof, the odors of the willows that dip therein and the white clouds that float high over the giant trees. And I leave to children the long, long days to be merry in, in a thousand ways, and the night and the moon and the train of the Milky Way to wonder at, but subject nevertheless to the rights herein-after given to lovers.

I devise to boys jointly all the useful idle fields and commons where ball may be played; all pleasant waters where one may swim; all snow-clad hills where one may coast; and all streams and ponds where one may fish, or where, when grim winter comes, one may skate; to have and hold the same for the period of boyhood. And all meadows with the clover blossoms and butterflies thereof, the woods and their appurtenances, the squirrels and birds, the echoes and strange noises, and all distant places which may be visited, together with the adventures there found. And I give to said boys each his own place at the fireside at night, with all pictures that may be seen in the burning wood, to enjoy without let or hindrance and without any encumbrance or care.

To lovers, I devise their imaginary world, with whatever they may need—as the stars of the sky, the red roses by the wall, the bloom of the hawthorn, the sweet strains of music, and ought else they may desire to figure to each other the lastingness and beauty of their love.

To young men jointly, I devise and bequeath all boisterous, inspiring sports of rivalry, and I give to them the disdain of weakness and undaunted confidence in their own strength. I give to them the power to make lasting friendships, and of possessing companions, and to them exclusively I give all merry songs and brave choruses, to sing with lusty voices.

And to those who are no longer children or youths or lovers, I leave memory, and I bequeath to them the volumes of the poems of Burns and Shakespeare and other poets, if there be others, to the end that they may live over the old days again, freely and fully, without title or diminution.

To our loved ones with snowy crowns I bequeath the happiness of old age, the love and gratitude of their children until they fall asleep.

In only a moment, we both will be old;
We won't even notice
the world turning cold.
And so in this moment
with sunshine above;
My cup runneth over
with love.

Sometimes in the evening
when you do not see,
I study the small things
you do constantly.
I memorize moments
that I'm fondest of:
My cup runneth over
with love.
The Cup Of Childhood

by Vernie Larson Swenson

When I was a child, about the turn of the century, I lived on a farm in Minnesota. Closest to the Corner, South, in Kildata Township, their fields just across from our own, lived the John Malms. We didn’t often have a close-up of Mr. Malm; he was seldom a church-goer, and whether through diffidence or by nature, not very sociable-seeming. We thought it a sad, sad thing, when Mrs. Malm died, leaving such heavy responsibilities to Selma, the eldest — who couldn’t have been more than ten or eleven. Selma and Alma and little Esther were pupils with the rest of us at 40 West, John- ney, the one and only boy, on a farm that needed boys, seemed to us a replica of his father.

Selma and Alma were shy and silent girls, never seeming self-forgetful or secure. We girls felt protective of the Malms — though Selma was close to my age — thinking they couldn’t be happy at home, and seemed so ill at ease at school, with a sort of on-the-defensive attitude.

Selma, as said, was my age, or close to it, and so would walk along with me and my pals, Julia and Ruth, on our way home from school as far as the Corner, from where we went our separate ways. The Malms and the Claus Laner children would then continue southward together, being neighbors. But Ruth and Julia and I, differing only a matter of months in our age, formed, throughout our adolescent years, an almost inseparable trio. Inseparable that is, except, as happens frequently in such three-way friendships, any two of us would occasionally quarrel — perhaps for no reason, but that we craved the excitement or diversion — gang up on the third of us, excluding her from our secrets, making a deliberate show of leaving her out. It was cruel fun when you spoke little to one, forgetting to be the one shut out. Fortunately there would still be Selma to turn to, so that she would not be reduced to taking up with the younger children for companionship! But with Selma, perhaps you simply didn’t have enough to discuss anything very personal; just friendly talk about school and church or whatever polite subject came to mind.

It may not have been during one of these threesome situations at all — Ruth may merely have been out of school for some reason at the time. Anyway, Julia and I had both “ma- tured” that season, and — forewarned though we had been by our mothers that this profound experience might come about at any time — this phenomenon of “becoming a woman” (a phrase we had heard) had prompted in us a quite natural curiosity and interest in the whys and wherefores of life.

It was while we were walking along toward the Corner on our way home from school and doing a bit of lagging behind the rest so as to be free to exchange confidences on new-found topics of profound interest — that the disturbing thought came to us: Selma, Selma — we said — she was close to our age! What if she had no one now to tell her anything — what if, suddenly, she should have this experience, why it would be just awful — Why she would be scared to death, wouldn’t she? Yes, she would! The way we would have been, if our mothers hadn’t made us “ready” for something like that! And Selma had no mother. May- be your mother, I suggested, maybe your mother’s mother could sort of talk to her — since you’re neighbors! — She may- be would want it — Julia thought — not without asking Mr. Malm, should she — And Mr. Malm — well, he wasn’t much of a man to talk to — And, anyway, how could you talk to a man about anything like that?

No, it was obvious that was the answer. No — but couldn’t we couldn’t we kind of talk around the subject — sort of like the three of us having a secret? Because you couldn’t just go to your mother and ask; could we? No, you couldn’t. Well, then, wasn’t it our duty to tell her how things were for girls? Our Chris- tian duty? We agreed it was! We felt very self-righteous, now that we had reached this virtuous decision.

It was a simple enough matter to maneuver things so that we were walking along with Selma a day or so later. We broached the subject, care- fully, obliquely. We felt it our Chris- tian duty, we said, since she had no mother. To tell her a few things about Life, we said. The way our mothers — and older sisters — had told us. We leaped into Swedish, even, as was our wont, when a subject grew too pro- found for mere English. We took turns; when one hesitated, the other went valiantly on.

We had been prepared for whatever reaction we thought; we thought. Like Selma going into a sort of nervous giggling over so embarrassingly subject, to cover up her blushes. Or, if we’re not very careful, even being frightened enough to burst into tears. We were not prepared, not for fear or for any other emotion, as she let us stumble along with our little girl - trying-to-talk-oh-so- grown-up look on her face. Finally, when we were quite done, and were wondering uncomfortably if perhaps she hadn’t understood it all — or, still worse, maybe we shouldn’t have made it our business to talk about such things after all — then Selma turned toward us and met our eyes quietly, gravely. In that moment, it was she who was a woman, the awkward adolescents:

"Alt dåntalade Mamma om för nu förbjudet att du Tänker mamma told me about before she died.)

It took a moment for this to reach us, as we trodged along. That Selma had known so long what we had learned only so recently..."

I was strangely moved by this incident. I think Julia was, too. We discussed it, later; people often like to look wonderingly at each other and say: "She knew. All this time she knew." Our whispering confidences sort of thinned from that time to the merely occasional, off-hand reference; perhaps we sensed, uncomfortably, that our "virtuous" urge to in- form had not been prompted solely by Christian concern. For myself, I was to see a quite different Selma from the one I had thought I knew from her awkward, different manners.

Beneath the surface was a person, miles ahead of us in her reach toward womanhood. Who was already assum- ing the burdens of womanhood in her care of a household and younger children; while we were protected, carefree ways. I was to think very solemnly and deeply about a scene I could not banish from my imagination: a mother calling close to her — as she must have sensed her own life ebbing — this young daugh- ter barely approaching teens, to lay upon her such hard truths as she must know for the care of the younger ones, and for her own welfare. Thinking about it made an ache come in my throat; it was sadder, sadder — and braver — than anything one could read about in books... Wasn’t it?

At the death of my mother at the age of ten, I will relate as much as I can remember.

My mother died in the night and I was told about it the next morning by my father. It seemed that this had the effect that from being a carefree child I at once became a person with a different outlook on life. Altho I did not at the time realize what the full impact of this would be, I knew that from then on there immediately was a responsibility for my younger sisters and brother who were too young to know the tremendous loss they had suffered.

My aunt, my mother’s sister, came for the funeral and stayed on for a while. When I would return home I was informed that she was to take our baby sister, who was then one year old, home with her to keep. This was perhaps as much of a blow to me as the death of my mother for I had helped care for the baby a great deal of that time. When the baby was born my mother’s aunt who was the midwife of the community, did not arrive in time as she lived several miles away and had to be gotten to our house by horse and buggy. My father stopped in at the next door neighbor and woke the wife there to come to our place as soon as possible. By that time the baby was already born and I was the only one in attendance, having been called upon to remain there while my father was gone.

To make a long story short, my sister lived with my aunt and her hus- band until she was seventeen when they both died during the flu epidemic and she was told that they were not her parents and that she was not my cousin but instead my sister. Now we have lived together for many years and I can say that in the providence of God, and as I look back over the years of my life, has been a happy and joyful experience and looking back, it holds joy unspeakable and fill of glory for all those who trust in the Lord. Sincerely, Selma Malm

Epilogue

Dear Miss Malm:

When you were a little girl you had a friend named Vernie Larson. She passed away recently but before she died she wrote a book about her child- hood that contains a charming episo- de concerning yourself. With your permission we plan to print this and in addition would be pleased if you could tell us your own recollection of the events mentioned.

Sincerely, Paul K. Hudson, Editor

Prof. Hudson:

With regard to the reaction I had

At age thirteen
The Cup Of Remembrance

A new theory suggests that the famous Taj Mahal may not be just a memorial to a Mogul's favorite wife - but her actual "portrait" in architecture.

Shah Jahan, who as fifth Mogul of India began building the Taj in 1632, was known as a zealously religious Moslem. One of the tenets of his faith was that no actual person — or even a human figure — be represented in Moslem art, which limits itself to geometric designs.

What was the Shah to do, then, when his "Mumtaz Mahal" - his "chosen of the Palace" and lover of 19 years, died.

The Shah, who sat on a solid gold throne flanked by life-size emerald and ruby pavilions, couldn't for religious reasons, allow himself the equivalent of a $1,987 locket with his beloved's picture in it.

Instead, he called in architects from far away Turkey, Persia, Italy, and France, and embarked on a series of conferences. What he said may never be known, but we know the result — the magnificent Taj Mahal which took over 20,000 men 22 years to build.

Two terraces, suggesting two legs, are crowned by a dome (head) which swells to the height of 80 feet and is 175 feet in circumference.

Twin domes (like breasts) rise on the terraces. These are flanked by slender minarets.

And a lace-like screen of white marble, considered one of the world's finest art treasures, stands in front of the tombs of the Shah and his beloved.

Could this screen represent a beautiful Moslem lady's veil?

The great entrance is ornamented in low relief. Directly under the dome in an octagonal chamber are the marble tombs of the Shah and his wife — and a single flower on her tomb is made from three hundred stones!

While we may never know exactly what the Shah told his architects to do, history records this story: Disgraced and broken from a revolt against his expenditures, he was imprisoned for seven years across the river Jumna from the Taj. His dying request was to be taken up in the tower of his prison palace for one last look at the Taj.

Here, just as dawn was breaking across the sky, he took his last look at the Taj across the river, from a window framed in Moslem archways.

One last look — at his beloved's "picture"? At a "personal snapshot" which cost $3 million dollars?

The Cup Of Death

After Socrates had been condemned, but before he took the cup of death (hemlock) in his hands he addressed the people as follows:

I say to you, who have condemned me to death, that immediately after my death a punishment will overtake you, far more severe than that which you have inflicted on me. For you have done this thinking you should be freed from the necessity of giving an account of your life. The very contrary however, as I affirm, will happen to you. Your accusers will be more numerous, and they will be more severe, inasmuch as they are younger and you will be more indignant. For, if you think that by putting men to death you will restrain any one from upbraiding you because you do not live well, you are much mistaken; for this method of escape is neither possible nor honorable.

Moreover, we may conclude that there is great hope that death is a blessing. For to die is one of two things; for either the dead may be annihilated and have no sensation of anything whatever; or, as it is said, there is a certain change and passage of the soul from one place to another. And if it is a privation of all sensation, as it were, a sleep in which the sleeper has no dream, death would be a wonderful gain. For I think that if anyone, having selected a night in which he slept so soundly as not to have had a dream, and having compared this night with all the other nights and days of his life, should be required on consideration to say how many days and nights he had passed better and more pleasantly than this night throughout his life, I think that not only a private person, but even a great king himself would find them easy to number in comparison with other days and nights. If, therefore, death is a thing of this kind, I say it is a gain; for thus all futurity appears to be nothing more than one night.
Mr. John E. Farley, new National President (top left) is switching supervisor for Illinois Bell Telephone Company; but in his spare time, he has always been a Lake Michigan sailor. He owns a power boat but crews in sailboat races as often as possible. Jack joined the Engineering Department of Illinois Bell Telephone Company in 1948 and worked with television and mobile radio systems. He has a rather interesting and extensive career in the Bell System. He was at Bell Telephone Laboratories twice. In 1955 he worked at Bell Laboratories on the development of the first completely transistorized communication receiver in the VHF region. During the 1950-60 time period, Jack was at Western Electric Company's Defense Project Division heading a group coordinating the solution of computer equipment and program problems connected with the SAGE system of the U.S. Air Force. In 1960 he returned to Illinois Bell in their newly formed Marketing Department as district marketing manager.

Dr. John 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.

Walter K. MacAdam, Vice President—Government Communications of the American Telephone and Telegraph Company—is coordinator of Government Communications for the Bell System. He began his telephone career in 1937. Following Engineering and Plant assignments in Atlanta, New York and Denver he was appointed Superintendent of Engineering for the Western Electric Company of the first DEW Line project in the arctic in 1953, and subsequently Area Chief Engineer for Long Lines in White Plains, New York. In 1959 he became Assistant Chief Engineer of A.T. & T. in New York. He was named Vice President in 1960. (Continued Next Page)
Born in New York City, Mr. MacAdam holds a Master of Science degree from Massachusetts Institute of Technology. He is Past President of The Institute of Electrical and Electronics Engineers and is a Director of the United Engineering Trustees. He is a National Director of the Armed Forces Communications and Electronics Association. He is a member of Tau Beta Pi, Sigma Eta Kappa Nu, the National Aviation Club, National Space Club, and is a Fellow of the American Association for the Advancement of Science.

Mr. MacAdam is married to the former Rilla M. Reed. He and his family live in Valhalla, New York.

Charles C. Rogers was born January 27, 1931, in Crawfordville, Indiana. He completed the BSEE degree at Purdue University in 1953 and subsequently served in the US Air Force as an electronics officer on a long range radar. After discharge he became general superintendent of the Crawfordville Electric Light and Power Company. Returning to Purdue in 1957, he served as an instructor and conducted research in magnetic scattering. He completed the doctorate degree in 1960.

After spending nine months as a research engineer with the Collins Radio Company, he joined the faculty at Rose Polytechnic Institute where he has conducted extensive course and laboratory development in circuits, electromagnetics, and communication theory. In 1965, he became chairman of the electrical engineering department, the position he now holds. He was also instrumental in establishing the Epsilon Eta Chapter of Eta Kappa Nu at the Institute. Since joining Rose, he has participated in summer programs at Stanford University in plasma physics and at Princeton University in digital computation.

Dr. Rogers has served on the advisory board of the Aerospace Research Applications Center at Indiana University and as vice chairman of the Central Indiana Section of IEEE. He is also a member of Sigma Xi and Tau Beta Pi.

Professor Lloyd B. Cherry is Acting Dean of Engineering at Lamar State College of Technology and Director of the Lamar Research Center. He holds the BA (1936) and MA (1937) degrees in Physics from the University of Texas and the BS in Electrical Engineering (1951) and the Professional Degree of Electrical Engineer (1951) from Oklahoma State University.

In the summer of 1964 he served as an educational consultant for U.S./A.I.D. in India. In this position he taught a course in transistors to nineteen Indian Engineering Professors.

Professor Cherry received the Western Electric Award in 1964 for excellence in Engineering Teaching. This award was made at the Southwest Meeting of the American Society for Engineering Education in Albuquerque, New Mexico. In 1962 he was named a Fellow in the Institute of Electrical and Electronic Engineers, and in 1967 he was named a recipient of the Piper Award for excellence in college teaching.

Mr. Cherry is a member of Sigma Xi, Eta Kappa Nu, Sigma Tau, Sigma Pi Sigma, Blue Key, Phi Theta Kappa, and Phi Kappa Phi.

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

Mr. Bosner was born in Beaver City, Nebraska, January 11, 1925, and received his B.S.E.E. from the University of Southern California in 1950. He has since worked with the California Electric Construction Company (1950-52) as a designer and estimator of industrial electrical systems, with C. F. Braun & 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. Bosner is presently establishing an engineering department for the Johnson-Petier Electric Company. He has been a Boy Scout Leader since 1961 and was a Trustee of the Presbyterian Church from 1959 to 1961.

Mr. Bosner 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.

An Announcement For 1969 Graduates

Washington University's Department of Electrical Engineering offers specialization on the masters and doctoral level in four areas: computers and computer systems, engineering biophysics: applied physics and electronics: electrical and electronic systems.

Current active research:
- Coherence in lasers
- Theoretical micromagnetics
- Charge transport in rare-earth flurides
- Electric motors with high-harmonic inputs
- Phase-quantum for coupled microstrip
- Conductivity in Pin-N junctions
- Optimization of switching transistors
- Macroscopic computer systems
- Pattern recognition and image enhancement
- Using digital computers
- Computing computer graphic systems
- Neurophysiological auditory system
- Acoustics
- Radiation calorimeter systems
- Computer enhanced fetal heart beat
- Computer in-patient monitoring systems
- Biological control systems
- Electromagnetically excitable materials
- Microwave-contractile tissue

Financial support is available to well-qualified students.

A futuristic Ordinance experimental design for "puppy rubs," submersible assault amphibian cargo and personnel carriers. The puppies were designed to be stowed inside a submarine and used as assault carriers on land.

The FMC Company, like many others, is employed in a wide variety of defense programs of both chemical and mechanical natures. We have developed a much improved amphibious personnel carrier, the LVTPX12, that can be landed from a ship at sea. It employs water jet propulsion which drives the carrier faster with half the horsepower.

A concept created by our engineers could allow large submarines to transport troops to within a safe distance from shore. It would then transfer troops to a smaller vehicle looking like another submarine with outside tracks on it. This vehicle would crawl along on the bottom or could swing to the top and then land on the beach. We are working on a variety of other vehicles for carrying missiles and other fire power. Our hydrofoil built boats are also being considered for military application where it is necessary to go from land to water rapidly, and vice versa. Our Northern Ordinance Division in Minneapolis is the principal Navy facility for producing shipborne missile launchers and guns. They are working on new concepts for faster more reliable missiles launched from ships. Our Portland Division is building a new series of high-speed patrol boats for the Navy.

The Defense Department is giving considerable attention to faster nuclear powered aircraft carriers and to helicopter carriers that can move rapidly into an area such as the Mekong Delta. Also being investigated are the air cushion type of vehicles in which the vehicle floats over the land or water by a cushion of air created by a fan blowing downwards.

Present defense programs concentrate substantial effort of weapons systems teams in new types of aircraft and air transport systems. New propulsion systems, fuels, and high temperature materials will make it possible to increase the range of the large aircraft from 1975 to 50 percent more than today. The Defense Department seriously is looking at aircraft that can take off vertically from an airport and fly from city to city without the long landing fields and the long walks required to go from the aircraft to the airport.

There is much to be done in the military and commercial aircraft field. Although we have automatic collision avoidance equipment today, it is far from the quality we need. We expect to have the first universal aircraft tracking system in operation by 1975... Much work will... be done on supersonic aircraft to reduce sonic boom and other noises caused by aircraft on takeoff, flying and landing.

We are using new high energy fuels in rockets in the space program. Scientists are now giving attention to the possibility of using fuels of this type in aircraft...

For space defense, the Air Force is working in a Manned Orbiting Laboratory, a $1.5 billion project, which will be launched within the next couple of years. To start with it will use one of the Gemini capsules modified to include a laboratory. This laboratory could be equipped with devices for analyzing unknown satellites to determine whether they carry any military warheads.

A Fireside Chat with Cleo Brutti
CHAPTER NEWS

BETA, Purdue University — has had a successful year. The chapter had 92 members and nineteen professional and graduate students in the engineering curriculum during the 1967-1968 academic year. The Fall Meeting was also very successful.

KAPPA, Cornell University — S t u d e n t s at Kappa have been busy with their group activity called "the Kappa Cup," which was held on the campus. The event was a success, with many students attending.

On a recent trip to New York City, the chapter members enjoyed a tour of the United Nations Institute facilities. The trip was arranged by Dr. L. Greenstein, the chapter faculty advisor.

ALUMNI LUNCHEONS on the first Monday of each month, OCTOBER TO MAY AT THE ENGINEER'S CLUB Everyone Welcome !

PHILADELPHIA, Pennsylvania — The Philadelphia Alumni Chapter of BETA is planning a series of luncheons for the 1967-1968 academic year. The first luncheon will be held on September 21 and will feature a panel discussion on "The Future of Engineering Education." The guest speakers will be Dr. L. Greenstein, one of the chapter's faculty advisors, and Mr. John Smith, an alumnus from the class of 1962.

Early in May the chapter initiated eleven new members. The new members were invited to a banquet held on May 5, which was attended by all the active members of the chapter. The new members were presented with medallions, which they will wear at all future chapter meetings.

The chapter also plans to sponsor a trip to the American Society of Mechanical Engineers (ASME) National Convention in New York City in June. The trip will include visits to ASME headquarters, the ASME National Building, and the ASME headquarters in Washington, D.C.

IOTA, University of Missouri — The University of Missouri Iota Chapter of BETA has been active throughout the academic year. The chapter has sponsored several events, including a guest lecture series, a series of technical workshops, and a series of social events.

On November 15, the chapter sponsored a "Meet the Faculty" event, which gave students an opportunity to meet and interact with their professors.

During the latter part of the spring semester, the membership continued to grow with the addition of twenty more members.

It was decided that the Gamma Chi Chapter of BETA at Lake Washington would hold its annual banquet on May 11, 1968. The banquet was well attended, and many students were able to network and socialize with their peers.

As a result of the successful year, the chapter plans to continue its activities and traditions in the upcoming academic year.

DELTA, University of Denver — The Delta Chapter of BETA was honored for its outstanding service and leadership during the 1967-1968 academic year. The chapter members were recognized for their contributions to the engineering education community.

The chapter held its annual banquet on May 17, 1968, at the Hotel Colorado in Glenwood Springs, Colorado. The event was well attended, and many students were able to network and socialize with their peers.

The chapter plans to continue its activities and traditions in the upcoming academic year.
What is there left for you to discover?

Cyrus the Great, King of Persia, built a communications system across his empire some six centuries before the Christian Era. On each of a series of towers he posted a strong-voiced man with a megaphone. By the 17th century, even a giant megaphone built for England's King Charles II could project a man's voice no further than two miles. This same king granted Pennsylvania to Admiral William Penn as a reward for developing a fast, comprehensive communications system—ship-to-ship by signal flags.

We waited for the combined theories of Maxwell, Hertz, Marconi and Morse before men could transmit their thoughts by wireless, though only in code. Only after Bell patented his telephone and DeForest designed his auditory tube could men actually talk with each other long-distance. Today nations speak face-to-face via satellite. Laser-beam transmission is just around the corner. Yet man still needs better ways to communicate across international boundaries.

In a world that has conquered distance, in a world whose destiny could hinge on seconds, man is totally dependent on the means which carry his voice and thought. It is this means that we in Western Electric, indeed the entire Bell System, have worked on together since 1882.

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Western Electric MANUFACTURER OF SUPPLY UNIT OF THE BELL SYSTEM

The Great Sahara Mousehunt

Catherine Collins and
Miggs Pomery

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27TH MARCH

Three guns went out early this morning and came back with two gazelle bagged by John and Frank. Hank went to work, skinning and cleaning with wonderful dexterity, put the hide and skulls to dry for his collections and gave me the meat for dinner. I have marinated it in olive oil, lemon juice, onions, garlic (bless Randolph for insisting on our bringing garlic along) and salt. The skin and skulls are hanging in No. 2 car. Catherine has taken me tenderly to whiff the interior.

Do you smell anything sort of mortuary? she whispers unhappily.

I try to be comforting. 'Hank says there is no bacterial action in this dry desert air,' I say. If anyone says a thing definitely enough I am inclined to believe it. Catherine is not convinced.

I'm not worried about bacteria, she says crossly, 'I just don't like the smell.'

Today is laundry day with plenty of water, cold though it be, and a brisk wind for drying. Catherine pours her things and Winston's against a convenient rock, periodically slapping them with water. It is a far cry from that pink washing-machine with its chromium-plated bunnies. Winston holds up his end of the labour detail by supplying her with water and oranges, and even hamp up a few pieces. The lighter pieces dry between the tub and the line. When she is through I do my lot, and in the meantime the men are all scrubbing and bathing here and there among the rocks. Liv spends the day whirling away at an old whisky-crate which he is converting into fruit-cups. He is going to hait them with gazelle meat, unmarinated, and put them among the rocks and, by special permission, in Abubaker's house. Abubaker has told him that the foxes raid the house whenever there is food around. In the midst of laundry, hair-washing and general clean-up Abubaker comes to call. We give him Winston's pink orange drink and he talks of foxes and other problems. Some of the people at his settlement have not been away for thirteen years. They or their parents fled here from Kufra at the time of the Italian conquest of that oasis more than thirty years ago. Most of the old men eat little and do not like to eat meat. There are some mothers who have never seen their sons, for there were too many then and not enough water to go round.

It is hard to imagine such a bleak life. They play cards, produce children and drive their camels to pasture as far as thirty-five kilometres away on the other side of the mountain. They do not appear to grow anything except one or two tired tomatoes. They have one radio, which they have begged Jack Thompson to fix. He needs a part which Abubaker says may take six months or a year to get, and we can't wait! Abubaker himself is from Kufra. He has been here seven months and he would like to take his wife, his children and his camels and settle in the Chad.

In the afternoon Abubaker will take us to see the rock-paintings. There are many of them but we haven't the time to explore. When we arrive to pick him up at Ain Zawa, Catherine makes such a hit with her Polaroid that he invites her into his cave to photograph his family. I tag along with my less dramatic camera and the men sit in the cars simmering with envy. The children all have their heads shaved with appealing little tufts of hair left, by which to yank them into paradise should occasion demand. A giggly young wife with a baby at her breast lets us photograph her without demur. She wears red flowered trousers, a crimson striped burlark and a black head-shawl. We both think her pretty. She is rather a bear of a woman, with a black and statuesque and resentful. She pulls her shawl across her face until Catherine peels off the first picture and presents it to the first wife. In a moment the second girl has dropped her shawl, and pulled it well aside to show a breast covered with gold jewelry, heavy ears-rings flashing as she throws up her head. We were both sick at not having colour film, and worried because the entrance to the cave is so dark. Catherine parts sadly with the best of her pictures but still manages to keep a couple.

To reach the cave-paintings requires a fair percentage of mountaineering blood. Catherine gives Charlie her camera to carry, somebody else her films and somebody else her hand. She screws her eyes tight and leaps in the most petrifying fashion. Heights are not one of my fears, but I am too small to scale some of these boulders, and I keep Liv close. Catherine says for the first time she is glad Alan is not here. She says his head for heights is even worse than hers, which is only to say that he has none at all.

The paintings are more than worth the risk. They are no rough primitives, but delicately painted in violets, scarlet, clay blue and white; cattle, men, one with a bow, women and children. The cattle are long-horned. How many thousand years since this country was able to support any sort of cattle? Was this sand really covered with true grass, these skeletal mountains with the flesh of earth, grass and trees? Have a thousand or more years of drought and wind blown it all away? We would all like more time to探究 these parts, but we've lost too much time on clutch-plates and such, and we must go on.

28TH MARCH

Last night the wind blew from the south, strong and hot. It roared in from the plain, with the thundering of an express train, turning our boulder village into a funnel of rushing air. Sand in eyes, ears and beds, cups tinkling across the plain. A camp-bed, unoccupied for a moment, jumps the rocks and rushes away in a frenzied dance, a stumbling body and strange Gaelic curses hurrying after it. The moonlight makes these boulders menacing and ghostly, and even more gigantic than they are by day. Who pushed them off the top of the mountain? Is whatever-it-was still up there? We talk ghosts and ghouls over our charcoal fire, and when Catherine goes off to bed behind a distant rock, which she thinks a better windbreak than anyone else's, she goes reluctantly. Liv and I make our beds close to the car, knowing that there is no such thing as a break for such a wind. As we snuggle down we hear a yelp.
Fox. Liv cries with satisfaction, tugging at his zipper. Everyone has said he would not get anything with his homemade traps. Before he can disengage himself from his sleeping-roll the cry is repeated with increased and panicky volume from the direction of Catherine’s windbreak. He finds her sitting up in bed, tangled in a cardboard ration-box and a roll of film which had rushed at her through the darkness with far-from-innocent venom. She pulls her head down into her sleeping-bag, confining wind and rocks and ghouls alike to outer space, but obviously expecting anything to happen.

This morning everything is still and hot. We refill on water and pack up. We have ahead of us the longest lap without water, Uweint to Tekro in Chad, three hundred and twenty miles. About twenty-five kilometres south on the plain we cross the first of the big camels pastures. Water would certainly make a great grazing land of these plains. As it is the pasture is yellow and thin. We see fifteen or twenty camels neither hobbled nor attended. I don’t suppose there is any temptation for these animals to stray from the pasture until either it or they are dried up, at which point they would surely head back to the only water. Now the dunes are on our left, pyramid-shaped, every sharp sand-blasted edge in place. We have seen step pyramids cut out of the sand as though by a human hand, and now these, Catherine says nobody could have thought Egyptian geometry up without an object-lemon and here it is, where it has been for millennia and all the while the Egyptians had pretended to be so original. In 1912 Ralph Bagdnoff, a British Army officer with an adventurous spirit, made this journey with some model A Fords. He named some of the little hills we are now passing, Mud Lion, Sandara, Giant Flat Tops (there are a lot of these), Diane Gateway, Lone Tree (too tree, or perhaps we are not where we think we are), I try to draw silhouettes of these, or what I suppose to be these—but photography would be better. Drawing while one bounces over the sand is not much help to anyone. The going is good for the most part. We have not had to use the out-walker technique and have only had five boggings. It is really hot now, too hot to eat. We mix a variety of tinned fruit and have that for lunch. We have no bread and fortunately don’t want it. The bread we started with from Benghari was stale within a day, hard as a rock within two days. A fresh supply, baked in Kufra, lasted longer, as the Kufrans bake their bread with oil. But now even that is gone.

In the afternoon No. 3 has fuel-pump trouble and has to have the pump replaced. While John and Taffy work on that, Watson makes us all tea and we have a party with tea, hard tack and marmalade. It is late enough for the cars to cast shadows and we crowd into this relative coolness, gratefully. Watson and Liv don’t care much about the same things. They have two to the same school about a year apart, and they talk of the rough old days and the professor who used to twist their arms when sufficiently exasperated.

The pump takes an hour to fix and we are back on our way again. While Watson was tea-making I found a cache of ostrich-egg shells. Hank says they are easily a thousand years old. The children will like that. Twice we have seen old car-tracks; Francis says that there will be Leclerc’s Apr. Apart from Bagdnoff and Leclerc and the L.R.D.G. probably no one has this view before us. It has a splendid solitary beauty, and if, like Tennyson’s Ulysses, ‘I am a part of all that I have met,’ it surely belongs, a little.

We are late making camp. We have travelled one hundred and forty-five miles and we settle at last at the base of a rocky castle where there is a falcon. His kingdom is the turbulent ocean of dunes to the west, a stretch of rolling sand and a line of crested dunes to the north, marching in well-spaced fashion southward. We think that this is Bagdnoff’s James Gateway. The radio aerial is up; we are routing the remaining gravelle on charcoal, and Benghari is cross because we are late making contact. Jack taps off our news, how the cars are and where we think we are. He takes a long time, and we suspect that our report takes all of ten seconds while the rest of the time he devotes to exchanges of gossip with his chum, the Benghari operator.

A couple of the boys have been ill. We have had good water, not once having to use the water purifiers we brought along. Frank solves the mystery by saying that he saw the boys drinking from the camel trough at Uweint instead of at the tap. As he turns the gallop-over the embers he assures us that Charlie will give them each twenty-five pills and they will be all right. He then launches an argument as to how and whether you can really get a great teacher. It is an army regulation which Francis hasn’t heard of yet and he explores the possibilities with. The British mess-cup is a huge comforting thing which we have learned to look on a war, for when water is low and tea rationed. Earlier we agreed that if one cup acquires the soldiers have it all over the rest of us. But a greatcoat is an even huger and more comforting thing, and Francis decides that it is mathematically impossible to pack the one in the other. There is a glint in Frank’s eye. He is leg-pulling again. At last he confesses. In the Army this is a ritual as old as army-time. A new recruit or a green young officer is put to the test and watched with poker faces as he folds and prods and stamps upon his coat and cup. One intent young soldier was found by his sergeant undertaking this torment. ‘Hoo, mon,’ roared the sergeant, ‘you’ll never get it in that way. Ye man crawls on his hands and bottoms off.’—Which the poor man did, to everyone’s delight. If there is a grip in the Army, or a joke, Frank has heard it. He has a devilish look as he pokes at the charcoal embers. His bushy red-yellowish hair and beard seem to have got out of control, and his humorous eyes are reclined by the wind and sand. He is twenty-four. A Midlothian in Scotland, whose father and grandfather were coal miners. He says that he joined the Army for adventure but it is mostly polishing buttons. He and Liv have decided, on the strength of Frank’s tea-making skill, to open a tea-room in the middle of the Sahara. But perhaps it would suit Frank’s convivial temperament more to run a pub; it is easy to imagine him regulating customers from behind a bar—and booting. But now even that is gone.

As we sand-wash our dishes, Francis takes a census on who wants to be home, and when. Liv and I don’t care much, though Charles and Ginny Humprey, who have adopted our children, might. Watson has to be back at Oxford by the twentieth of April. Francis says: ‘Not a hope—but you could make it by the twenty-fifth. I’ve a special part I must be back for that.’ Catherine says that if Alan will fly to Faya she’d like to stay on indefinitely. The men think it would be a fine idea not to go back until July, when some of them are due for home leave anyway.

Francis takes a fix on the stars. There are no adequate maps for the area we are in now. It is up to him to get us to Tekro safely.

Francis is the product of two rigid institutions; Loretto School, in Scotland, and Sandhurst, England’s West Point, but he will come to arcs when he wants. He has sidehustles and shaggy hair, a wisp of round his chin and his shorts are held up—oh almost—by a safety-pin. His shoulders have broken to random length.

He likes schedules to be laid out and orders to be given, and as a military man has had a hard time adapting to Liv’s frequent change of plans and absence of thought to try organizing anybody. He is very dour and cross with his moment in gay and charming and full of enthusiasm, particularly when he talks about his three favourite sports—drinking, rugger and girls.

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