

BRIDGE

February '67

eta kappa nu



Winston Kock



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For two-thirds of a century, Bechtel Corporation has been recognized as a builder for industry and government, and for many years as a leading international engineer-constructor. Under single responsibility, the company provides every service necessary for the complete realization of projects — including economic and technical studies, engineering design, procurement, and construction or project management.

The Bechtel organization is large and diversified, with many staff specialists. Its deep and varied experience, world-wide contacts, and capacity for work are made fully effective for client service by the close integration of all activities under the direct control of the company's management.

COMPANY DESCRIPTION

Bechtel today is the outgrowth of a family construction business established in 1898. During its early years, it played an important role in the development of the West, participating in such projects as Hoover Dam and the San Francisco-Oakland Bay Bridge. Headquarters are in San Francisco, with major offices in various cities of the world.

Activities are geared principally to the requirements of such basic industries as petroleum, petrochemicals, chemicals, natural gas, electric and nuclear power, mining, ore processing and metallurgy, food and paper, cement and other heavy industrial plants — and to land use and development. In the public sector, the firm is active in water use and conservation, rapid transit, and the missile and space program.

Project responsibility is assigned to one of eight operating divisions or to a specialized scientific department. The divisions are Power & Industrial; Hydro & Transportation; Mining & Metals; Refinery & Chemical; Pipeline; International Power, Industrial & Metals; International Petroleum & Chemical, and Vernon, California. The Scientific Development Department provides service to clients directly and also works closely with the company's operating divisions.

Engineering offices are located in San Francisco, Los Angeles, New York City, Washington, D.C., Houston, Montreal, London, Paris, The Hague, and Melbourne.

Bechtel keeps pace with the growing body of scientific knowledge in all its areas of interest. The company will, in the future, continue to meet the requirements of its clients in a rapidly advancing world, with emphasis on work of magnitude, complexity, and challenge.

SPECIAL FEATURES AND ATTRACTIONS

As Bechtel continues to grow, its responsibilities increase, providing capable employees with opportunities for advancement with commensurate financial rewards and personal satisfaction. Bechtel has two separate plans which enable eligible full-time technical and administrative employees to participate in the company's success: the Trust Plan and the Thrift Plan. Contributions to the Trust Plan are made entirely by the company. Participation in the Thrift Plan includes contributions made by employees together with a percentage matching amount by the company on a regular basis.

The Bechtel Group Insurance Plan combines high-limit hospital, surgical, and extended major medical benefits with liberal life insurance coverage for employees and their families.

All the company's major offices are located in areas offering outstanding opportunities for cultural, recreational, and educational activities.

Bechtel is a large and dynamic organization. It is highly competitive in the best sense of the word. An employee's future with the company is up to him. Increased responsibility, accompanied by higher pay, depends upon the combination of appropriate openings and the individual's demonstrated ability to move ahead. Increasing knowledge and effectiveness through participation in professional societies, business study groups, and evening classes can improve one's readiness to assume more responsibility.

OPPORTUNITIES

Assignments in estimating, design and construction are available for engineers in the areas of the company's interest. These include hydroelectric, conventional steam and nuclear power plants; metallurgical processing plants; industrial plants; missile and space development; refineries; petrochemical and chemical plants; pipelines, and developmental research in all these areas. Specialists are employed from many branches of the engineering profession including chemical, mechanical, electrical, civil (structural and hydro), mining and metallurgical, architectural, nuclear, instrumentation, and automatic control engineers.

Engineers may receive, as applicable to their specialties and interests, such responsibilities as:

Estimating

Assist in the preparation of estimates, cost control, and cost analysis of design and construction activities.

Engineering

Assist in development of process design, flow diagrams . . . Prepare piping and instrument diagrams . . . Calculate heat and chemical balance, mass transfer and fluid flow . . . Size equipment . . . Write specifications . . . Requisition equipment . . . Design circuits, power distribution systems, lighting and instrumentation . . . Prepare design sketches, drawings or portions of construction plans.

Construction

Plan and schedule field work in close cooperation with project superintendent . . . Inspect equipment as received and after installation . . . Perform quantity take off for equipment, concrete work, structural steel, instruments and piping, electrical conduit and wire. On the basis of this information make preliminary manpower forecasts . . . Read, review and follow job specifications and drawings.

FOR MORE INFORMATION, WRITE TO:

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OUR COVER

Dr. Winston E. Kock is the first in history to win the Eta Kappa Nu Grand Slam, i.e., all of the honors conferred by the Association. He was elected a regular member by Tau chapter in his college days and later was presented their Award of Merit for Outstanding Alumni. He was selected the Outstanding Young Electrical Engineer in the United States in 1938. In 1944 he was elected National President. Finally in 1966 he was elected Eminent Member. BRIDGE sends its congratulations and best wishes to Dr. Kock.

ETA KAPPA NU

Electrical Engineering Honor Society

FEBRUARY, 1967, Vol. 63, No. 2

Editor and Business Manager
Paul K. Hudson

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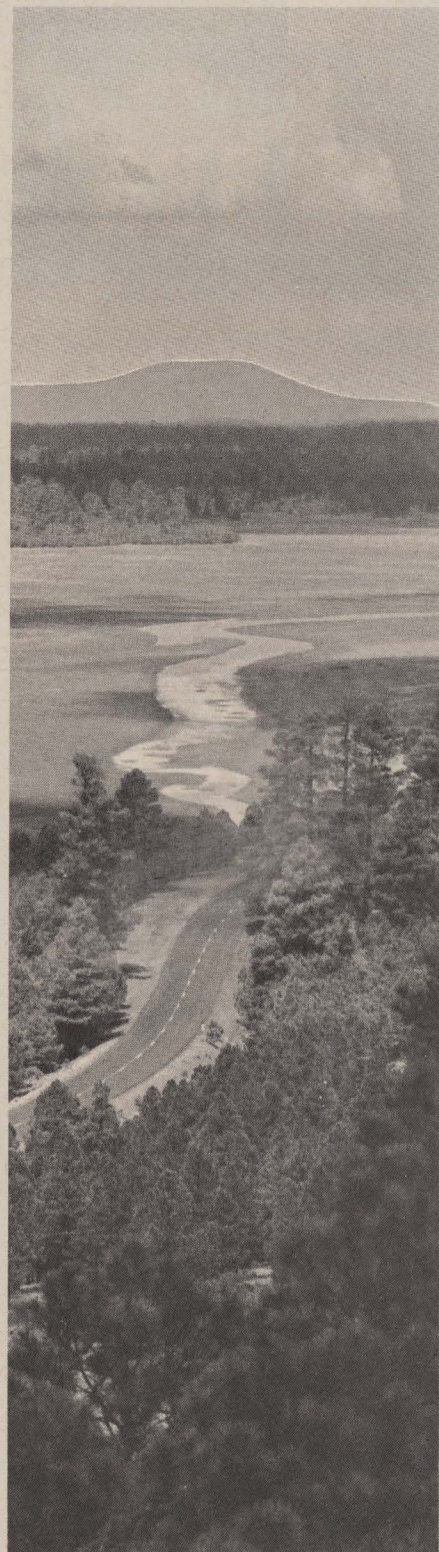
The BRIDGE is published by the Eta Kappa Nu Association, an electrical engineering honor society. Eta Kappa Nu was founded at the University of Illinois, Urbana, October 28, 1904, that those in the profession of electrical engineering, who, by their attainments in college or in practice, have manifested 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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Member Association of College Honor Societies

Real and Imaginary



LETTER FROM ALICE

Dear Mom:

Today, I found God!
You know how I've looked for him?
For so long... In so many places...
In churches of every denomination
I've knelt, searching for him;
I've hunted him at the firesides of friends;
I've watched upon the hills at midnight;
I've listened beside the rivers at evening;
Barefooted, I've trudged the sands at dawn;
I've walked bareheaded in the rain
Lifted my face to the snows,
Held out my arms to the wind—
But never did I feel him near me.
I search with love at first,
Then fear, and lately, Mom,
With mocking laughter.
Others found him; why could not I?
And now, I have!
This very day!
Upon the street, just at noon,
Amid the clamor and confusion
And hurry and heat.
How strange...
He was standing
With Kenny Mom!
He had on riding boots,
And the sun
Made his hair look almost red,
And his eyes were blue — and glad —
And when Kenny said,
"This is Alice,"
He took my hand
In both his gentle ones
That were as brown
And as hard as Kenny's
And said, with a little catch
In his beautiful, beautiful voice,
"Why, Alice, I was beginning
To think you'd never find me!"
Then, I knew!
Oh, Mom, I knew!...
Is that what
You've always meant
When you said
"God is Love"?
Is it, Mom?
Sort of like you always told us
That Santa Claus
Is the spirit of Christmas?
That way, Mom?
You're wonderful.
And please, may I bring him home
For the holidays?
And Oh, Mom!
You were right!
He's a Methodist!
Iris Jamieson.

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Go Westinghouse, Young Man!

*A modern fable with
technical overtones*



Once there was a young college sen-
ior named Jack who wanted desper-
ately to climb the beanstalk of
success, facing the kind of challenges
his forefathers faced on the frontiers
of early America.

But Jack wasn't sure which kind
of beanstalk he wanted to climb.

His mother wanted him to take a
job at the local store so he'd be close
to home.

His friends urged him to join a
protest movement.

His professors wanted him to go
on to graduate school.

Then Jack met a Mr. Greeley
from Westinghouse. Mr. Greeley was
a recruiter of college students. He
was a kindly man with a warm smile,
and he explained how Jack could
get an advanced tuition-free degree
while working at Westinghouse.

Mr. Greeley also explained that
Westinghouse, being a giant organi-
zation, was in a much better position
than most to undertake projects that
would benefit the less fortunate
peoples of the world.

Mr. Greeley's advice was:
"Go Westinghouse, young man!"
And Jack did.

Given a choice of six large oper-
ating groups* within Westinghouse,
Jack elected to join the Atomic, De-
fense and Space Group and was
promptly assigned to work on an
oceanographic project.

A fast learner, Jack took root quickly, reassuring his
graying but still pleasant-faced mother, "Don't worry,
Mom, I'm on my way to the top."

Though officially a trainee, Jack was a big help in the
development of *Deepstar*—a Jules Verne-like undersea ve-
hicle designed to explore the ocean depths. One of *Deep-
star's* many missions was to search for food sources to meet
the growing needs of a hungry world.

The project was an enormous success; Jack's manage-
ment was delighted.

But before a grateful UNESCO could honor him publicly,
Jack obtained a transfer to one of the many space projects
Westinghouse coordinates.



Jack's assignment: help develop a rendezvous system for
Gemini capsules.

To the news publications of the nation, this was the
story of the year. In fact, one of the big syndicates assigned
their most beautiful, technically oriented woman reporter
to get an exclusive story from
Jack... at any cost.

One night while returning
from work... Jack was ac-
costed by the beautiful young
newswoman, who suggested
that Jack give her an exclu-
sive bylined story de-
scribing the project in
detail.

Though taken aback
by her beauty, Jack
never lost sight of his
duty. He pleaded with
the reporter to hold her
story until after the
launching. She agreed on the
condition that Jack would pro-
vide her with enough informa-
tion for a subsequent story
that would win her a Pulitzer
Prize for news reporting.

The pressure on Jack and
his closely knit engineering team tightened. By day, they'd
work on the space guidance system; by night, Jack would
feed background information to the beautiful, technically
oriented reporter. It was hard work, but
it was important work.

Finally the day arrived for which the
world had long waited. America's two
capsules rendezvoused successfully. Man-
kind was now assured of a stairway to the stars.

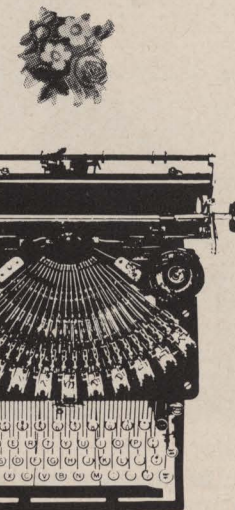
While television-viewing millions rejoiced, Jack was as
good as his word, offering the beautiful lady reporter the
story she wanted so badly.

However, the girl, now smitten with
Jack, turned her back on the Pulitzer
Prize, preferring instead to join Westing-
house, attend an advanced education
school and obtain a degree in engineer-
ing. (Women are welcome at Westing-
house, an equal opportunity employer.)

Now they both work at Westinghouse
—while Jack designs atomic reactors for America's newest
missile-firing submarines, his beautiful
ex-reporter wife, an education specialist,
helps train Peace Corps volunteers for
overseas duty—and they're only a bean's
throw from the neat white cottage they
share with his mother.

And they all lived happily ever after.

*Moral: By planting your career seeds with
Westinghouse, you, too, can climb the bean-
stalk of success, overcoming giant obstacles
and earning a lot of golden rewards.*



You can be sure if it's Westinghouse



For further information, contact the Mr. Greeley from
Westinghouse who will be visiting your campus during the
next few weeks or write: L. H. Noggle, Westinghouse Edu-
cational Center, Pittsburgh, Pennsylvania 15221.

*The Westinghouse Operating Groups: Consumer Products; Industrial; Construction;
Electronic Components & Specialty Products; Atomic, Defense & Space; Electric Utility.



Introduction by Berthold Sheffield, Committee Chairman

On October 21, 1966, Eta Kappa Nu's Jury of Awards named Dr. Morton H. Lewin, of Princeton, New Jersey, Outstanding Young Electrical Engineer of 1966. Dr. Lewin is a Member of the Technical Staff at RCA Laboratories, David Sarnoff Research Center in Princeton, New Jersey. The Jury honored Dr. Lewin for his contributions to computer research in areas of logic, memories and input-output devices, and for his dedication to community activities. At RCA Dr. Lewin has received the highest scientific honor that RCA bestows — the David Sarnoff Award in Science. He has authored many technical papers, and holds numerous patents.

Honorable Mention was awarded to three outstanding

young engineers: Robert L. Brass of Bell Telephone Laboratories, Holmdel, New Jersey, was awarded Honorable Mention for his important technical contributions to electronic switching, and his unusual excellence in athletics. William B. Bridges of Hughes Research Laboratories, Malibu, California, was awarded Honorable Mention for his extraordinary contributions to the fields of laser technology, his inspirational leadership qualities and his dedication to church activities. Harvey Charles Nathanson of Westinghouse Electric Corp., Research & Development Center in Churchill, Pittsburgh, Pennsylvania, was awarded Honorable Mention for his outstanding contributions to the field of semiconductor physics and his meritorious guidance of young people.

Candidates for these awards are sought through nationwide circulation of Eta Kappa Nu Nomination Forms

which are enclosed with the annual "Spring Letter" of the Award Organization Committee. (Forms are available also from Paul K. Hudson, National Secretary, HKN.) Requirements for nomination have been the BSEE degree held not more than 10 years, and age not over 35 years. Winners are judged on the basis of outstanding performance in electrical engineering, and also in activities in areas such as civic, social, cultural and aesthetic and other areas.

The Award Organization Committee members are: Robin Beach, Emerson D. Callahan, Larry Dwon, Irving Engelson, Anthony F. Gabrielle, Willard B. Groth, Nelson S. Hibshman, Everett S. Lee, Benjamin F. Lewis, Edgar W. Markard, John M. Montstream, Harlan J. Perlis, Robert W. Slade, Roger I. Wilkinson, Paul K. Hudson, and Berthold Sheffield, Chairman.

M. H. LEWIN - OUTSTANDING YOUNG ENGINEER OF 1966

Biography of Morton H. Lewin by Jan A. Rajchman

Morton H. Lewin was born August 20, 1931 in New York City. He received his elementary and secondary education in the public schools of New York City, and upon graduation entered Princeton University. His education was interrupted by military service but upon receiving his Honorable Discharge he returned to Princeton where he received the B. S. E. with honors in 1957.

As a result of his high school academic achievements, he received Stuyvesant High School's second highest academic award, the Phi Beta Kappa award, and earned both a Pulitzer Scholarship, awarded each year by Columbia University to New York City's ten most outstanding high school graduates, and a Princeton University Scholarship. He also played varsity football, was an orchestra member and was an editor of his high school's senior year book.

As a freshman at Princeton, Dr. Lewin complemented his scholastic activities with membership in the University Band and in Princeton's Triangle Club orchestra. Returning to Princeton as a sophomore, after completing his Army service, Dr. Lewin was already married and a father. In addition to the normal academic load he found that it was necessary to work a full half-schedule and sum-

mers as a Staff Member in the Plasma Physics Laboratory, Forrestal Research Center, Princeton, N. J. There he was engaged in the design of control and instrumentation circuits for the early "Stellarator" experimental machines. He continued his musical activities as leader of a campus dance orchestra and also wrote arrangements for local musical groups, including the Triangle Club orchestra. He was awarded the IRE Student Prize by the Princeton Section IRE as the outstanding EE senior at Princeton University, and was also recipient of the Jersey Central Power and Light Company Scholarship. In addition, he was elected to Sigma Xi while still an undergraduate.

After receiving the B. S. E. in 1957, he continued his education at Princeton with a Sayre Fellowship and received the M. S. E. in 1958. He was awarded the Charles Ira Young Memorial Medal and Plaque (the highest E. E. research honor at Princeton) for his Master's thesis work.

In 1958 he joined the Technical Staff at RCA Laboratories, Princeton, N. J., while he continued his studies at Princeton for the Doctorate. His first work involved a systematic study of the use of negative-resistance elements as digital computer components, using as a vehicle, the newly-developed device called the tunnel diode. This work was the basis for his Ph.D. dissertation at Princeton, for which he received a second Charles Ira

Young Medal, and for which he was a member of a team which was awarded the highest scientific honor that RCA bestows — the David Sarnoff Award in Science. Morton H. Lewin was awarded the Ph.D. from Princeton University in 1960.

Following this work, Dr. Lewin continued in research on the application of new solid-state devices as memory and logic elements. This included early pioneering work in ultra-high-speed switching circuits, and investigations of memory arrays fabricated by vacuum deposition and silk-screening. He was particularly concerned with read-only and associative memory realizations and made significant contributions to the literature in both fields. In particular, he directed a research group which constructed a prototype read-only memory using novel fabrication materials and interconnection methods. He also conceived a content-addressed memory information retrieval algorithm which is currently widely referenced in the literature. This work was recognized by RCA Laboratories by the granting of two of its Achievement Awards for Outstanding Research to Dr. Lewin — in 1959, for research on ultra-fast computer circuits and in 1963, for concepts and techniques leading to electronically-addressable punched card memories.

More recently Dr. Lewin has been engaged in research in computer systems, particularly time-sharing systems, and in computer-aided design.

He was responsible for the conception and development of a magnetic "pen and tablet" to allow a computer user to input graphic information directly to a machine. He has also devised a portable "electronic keyboard" to allow input of messages to a remote time-sharing machine via conventional telephone. He is presently responsible for the hardware and software development of a computer-controlled cathode-ray-tube display system, to be used as a research tool for further work in man-machine communication and design automation.

Dr. Lewin is the author of 10 publications and has 9 issued patents. He also has a number of additional patent applications awaiting Patent Office action.

He has participated in numerous community activities, including church, civic and charitable functions. In particular, he is a member of the Princeton Community Band, which gives a series of free concerts each summer and plays at other charitable functions. He was also awarded the gold pin for his long-standing participation as a Red Cross blood donor.

He has been Assistant Review Editor for the IEEE Transactions on Electronic Computers and has been a paper and book reviewer and referee for this publication as well as for numerous other computer and solid-state journals and conferences.

Dr. Lewin holds the rank of Adjunct Professor at Drexel Institute

of Technology, Philadelphia, where he has been teaching graduate courses for a number of years in solid-state circuits, switching theory and computer systems. He has also been a Visiting Lecturer in the E. E. Department of Princeton University. Further, he is teaching courses at some of the RCA Product Divisions and has also served as an MIT non-resident instructor for MIT summer cooperative students working at RCA Laboratories.

Morton H. Lewin married the former Sylvia Altman in 1951 and is the father of two daughters, aged 13 and 6, and two sons, aged 12 and 4.

(For information regarding the Award Dinner, see page 21)

Members of the Jury of Award for 1966 are: Wm. P. Smith, Dean of Engineering, University of Kansas; Clarence A. Gunther, Division Vice-President, Radio Corporation of America; Gordon W. Clothier, Vice-President, Allis Chalmers; Roger I. Wilkinson, Bell Telephone Laboratories; Berthold Sheffield, Radio Corporation of America; Willard B. Groth, IBM; Irven Travis, (Jury Chairman) Vice-President, Burroughs Corporation; Clyde M. Hyde, IBM; Halbert B. Miller, Vice-President, General Electric Company



YOUNG ENGINEER AWARD—HONORABLE MENTIONS



ROBERT L. BRASS

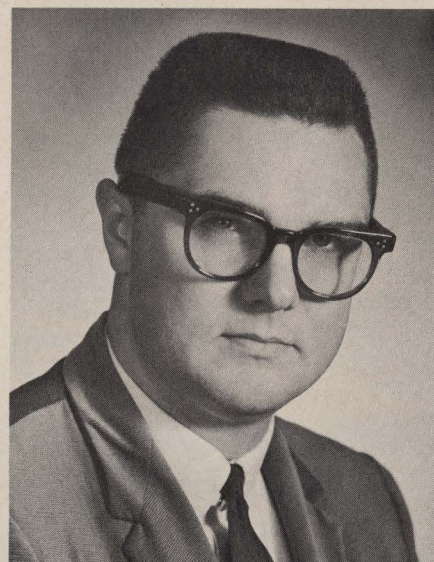
Robert L. Brass' interests and activities cover a wide range. He has done notable work in the fields of circuit design, programming and systems engineering at Bell Telephone Laboratories, Incorporated. In his community, he is active in theater, church and YMCA affairs. In his free time, he is likely to be found flying, sailing, skiing, or working on do-it-yourself projects.

Mr. Brass was born in Brooklyn, New York, May 15, 1935. His high school years were spent in Wethersfield, Connecticut, where he graduated from Wethersfield High School in 1953. He attended Worcester Polytechnical Institute in Worcester, Massachusetts and was awarded a Bachelor's Degree in Electrical Engineering in 1957.

After graduation, he came to work in the Electronic Switching Division at Bell Telephone Laboratories and was enrolled in their Graduate Study Program. As part of the program, he attended New York University and received a Master's Degree in Electrical Engineering in 1960.

In February, 1964, he was promoted to supervise a systems engineering group concerned with the application of electronic switching in the toll network. One of his group's initial assignments was to specify the features and requirements for an electronic switching system to be installed in the NORAD complex in Cheyenne Mountain near Colorado Springs, Colorado.

by John J. Yostpille



WILLIAM B. BRIGES

Bill is a native Southern Californian, having been born in Inglewood, California in November, 1934. He attended local public schools, graduating from Inglewood High School in June, 1952. He took all of his degrees at the University of California at Berkeley, receiving the BS, MS, and PhD degrees in Electrical Engineering in 1956, 1957, and 1962 respectively.

He joined the Hughes Research Laboratories in Malibu in July, 1961.

Bill made his most important discovery in early 1964 when he first observed laser action in the ionized species of noble gases. Performing his initial work with argon, he demonstrated laser outputs at several wavelengths in the blue-green portion of the spectrum. Because it is by orders of magnitude the highest power laser in the visible spectrum, the long term potential of the argon laser is obvious and enormous. It is already finding use in several important areas of application. Indicative of Bill's capacity for pursuit of an interesting development was his expansion of this discovery to over 130 new wavelengths in the visible spectrum from ions of gaseous species within a few months. He also managed to get a cw version of his early pulsed laser operating during this period. Thus, almost single handedly, he made available laser sources throughout the entire visible spectrum.

by Donald C. Forster



H. C. NATHANSON

Dr. Harvey Charles Nathanson was born in Pittsburgh, Pennsylvania on October 22, 1936. After attending public schools here, he went to Carnegie Institute of Technology, where he received his B. S., M. S., and in 1962 his PhD.

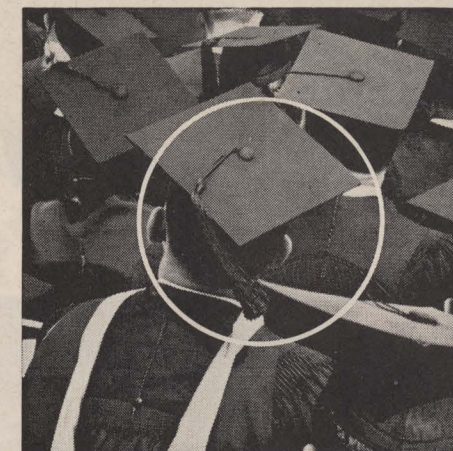
In the summer of 1962, he joined Westinghouse Research Laboratories where he began to work on silicon surface-controlled MOS devices. This led to his investigation of the first experimental three-terminal tunneling device in silicon.

In 1965, Dr. Nathanson (with R. A. Wickstrom of the Westinghouse Labs) invented the Resonant Gate Transistor, a significant breakthrough in semiconductor circuits, because it permits tuned circuits to be completely integrated.

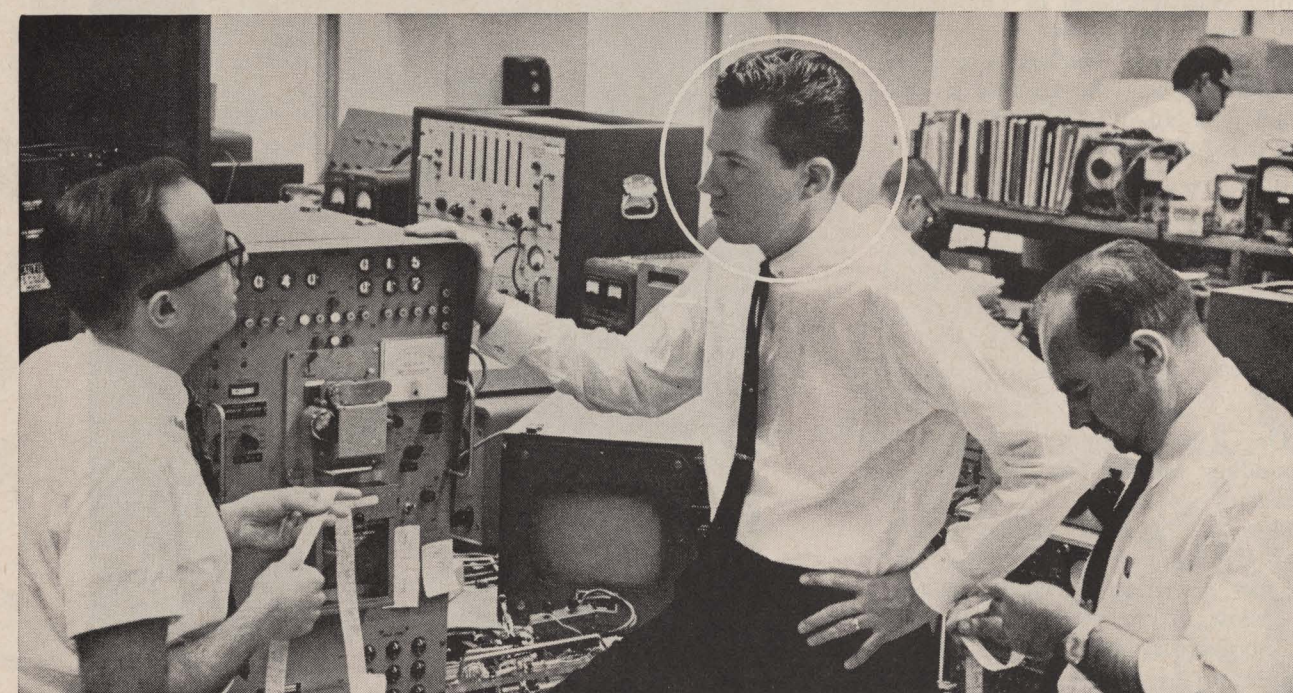
Outside the world of engineering, Dr. Nathanson's interests have been varied. One of his favorite projects was organizing with a physicist friend a teen-age motion picture group at the Young Men and Women's Hebrew Association. After giving the group a three-month course in movie-making techniques, Dr. Nathanson encouraged and supervised a 40-minute color movie called "Double Date" in which all the writing, photography and editing was carried out by the teen-agers.

Subsequently, along with a social worker from the Y, Dr. Nathanson helped to organize one of Pittsburgh's first television shows devoted completely to teen-agers.

by William Newell



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.



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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

Eminent Member

SIMON RAMO

Dr. Simon Ramo, Vice Chairman of the Board, TRW Inc., was inducted into Eminent Membership on August 25th, at the Statler-Hilton Hotel in Los Angeles, California. The induction team was made up of William Murray, President of the Los Angeles Alumni Chapter, William Smith, Vice President of Eta Kappa Nu, Tom Rothwell, National Director, and Clyde Hyde, National President. Dr. Ramo was the speaker at the Eta Kappa Nu - WESCON joint luncheon that followed.

Simon Ramo received the highest honors upon graduating from the University of Utah. He received his B. S., Electrical Engineering from California Institute of Technology (Magna cum laude) in 1933 and Ph.D., Electrical Engineering and Physics in 1936.

Dr. Ramo is distinguished as a Founding Member of the National Academy of Engineering and is a Fellow of the Institute of Electrical and Electronic Engineers, a Fellow of the American Physical Society, a Fellow of the American Institute of Aeronautics and Astronautics, a Fellow of the American Academy of Arts and Sciences, a member of the Visitors Committee, School of Engineering and Applied Physics at Harvard University, a consultant to the President's Science Advisory Committee, a member of the Patent Policy Committee of the National Academy of Sciences, and a member of the Business Advisory Committee of the Carnegie Institute of Technology.

Dr. Ramo was named Outstanding Young Electrical Engineer in 1941 by Eta Kappa Nu Association. He has been honored with Doctorates from Case Institute of Technology, University of Utah and Union College. He has been presented the American Academy of Achievement Award, Air Force Association Award, and the



Electronic Achievement Award by the Institute of Electrical and Electronic Engineers.

Dr. Ramo has served industry as Director of Physics Section, Electronics Research Laboratory, General Electric Company; as Vice President and Director of Operations, Hughes Aircraft Company; as Scientific Director, U. S. Air Force Ballistic Missile Program; as Executive Vice President, Co-Founder of The Ramo-Wooldridge Corporation; as President of Space Technology Laboratories, Division of Ramo-Wooldridge Corporation. He is presently Executive Vice President of TRW Inc.

OPPOSITE PAGE

The next eight pages comprise the first in a series of special BRIDGE Supplements dealing with selected subjects of general interest. This supplement is intended to be used as a Valentine by anyone who would like to send one to a friend!!!! Just remove the staples and the Valentine will fall free from the remainder of the magazine. The next special supplement will appear in the August issue. They represent only one of a number of things being done to make BRIDGE the most interesting and attractive magazine in America.



My First Love Letter

ELLERY B. PAINE

"DEAR ELLERY CAN I USE YOUR PENCIL?" This letter was passed across the aisle from the girl's side of the school room one afternoon when the teacher was looking in the other direction. The boy of nine had never before received a communication from a girl. The girl who wrote it was two weeks older than the boy. The boy thought she was the prettiest girl in the school. He liked to look at her but he was afraid to speak to her. When the water was passed he would watch to see which part of the tin dipper she used and then when it was his turn he would drink from the exact spot on the dipper she had used. The boy had heard of love letters but never had seen one. As he noted then she had called him "Dear" he believed this really was a love letter. Of course he at once passed his pencil to her.

This pencil was not an ordinary one. It is old and the boy likes to make it work. If it is held with the writing end down and the other end is pressed a part comes out that looks like the head of a turtle. When out to the full

The pretty girl on the previous page is actress Julie Christie. Photo courtesy MGM.

extent the head opens like a mouth and the black rod to make the mark comes into the mouth. Then as the pressed end is released the mouth bites the rod to hold it in place. When through writing the pencil can be up-ended and when pressed the mouth opens and the rod is swallowed.

As the girl uses the pencil the boy looks at the letter. The longer he looks at it the more certain is he that it is a love letter. He has had letters from Grandmother Smith and from his aunts which began with the word "Dear" but this is from a girl. He does not think a girl would use that word in writing unless she meant it to be a love letter. After reading it many times he puts it in his pocket and feels very happy.

The next day he writes a love letter to the girl and hands it across to her. "Dear Bertha do you want my pencil" is what he writes. The girl makes a bad face at him, sticks out her tongue and shakes her head to make an emphatic refusal. Never again was the boy to receive another communication from that girl.

Once before the boy had been rebuffed by Bertha. The pupils were sliding down the ice-covered bank north of the school building. Some had brought blocks of wood from the wood room to slide on. Most of them were sliding on their feet. The boy was amazed to have the girl call out to him "Come on deacon, slide with me." The boy had never been called by that name. The nearest to it was when John had called him the deacon's son after giving him tobacco. The girl held out her hand and as they slid the feeling of her hand covered by the red

mitten which she wore gave him a sensation such as he never before had experienced. It seemed to him he never before had had such a good time. They slid two times when the bell rang to end the recess.

The following day he wished to have more of these delightful slides so he asked the girl to go down the bank again with him. But the girl replied "If you want to slide go slide by yourself." That was the first rebuff and now the pencil had brought the second and final one. The boy was miserable as he thought of these happenings.

To make his misery greater he thought of the abundant evidence that the girl liked Halsey more than she liked him. There seemed to be nothing he could do except to avoid her and to feel sad.

One Saturday the boy's father told him to go and replace a pane of glass which was broken from a school window. It was very cold in the school for no fire burned in the stove. It took him a long time to do the job because he had trouble to warm the putty enough to stick in place on the window. As he worked he thought of Halsey and although he knew it was wrong to do it he looked in Halsey's geography because he thought he had seen Halsey write letters with this book open. He was sure this boy wrote to Bertha. And in the geography he found a letter not yet finished. It began "My dear little Lily." The boy realized that it was impossible for him to use such words as did Halsey. The boy returned home after he had repaired the window with a sense of guilt that he had looked in Halsey's book and with a realization that it was beyond his ability to make a girl like him.

But the boy kept his love letter. It seemed to him that it was precious. There was however the problem where to keep the letter. Nobody else should ever see it. He did not dare to put it with his things because some body might run across it. The only safe place for it is in his pocket. Winter passes and it is warm weather again. As time goes by the boy finds the letter is becoming worn and faded. The word "Dear" is becoming hard to read and the paper begins to break where it is folded. Something must be done with it. The boy thinks of the various ways of disposing of the precious letter. He can not think of tearing it up or of burning it. At last he decides that the best thing to do is to bury it as is done in the case of the body of a person who has died.

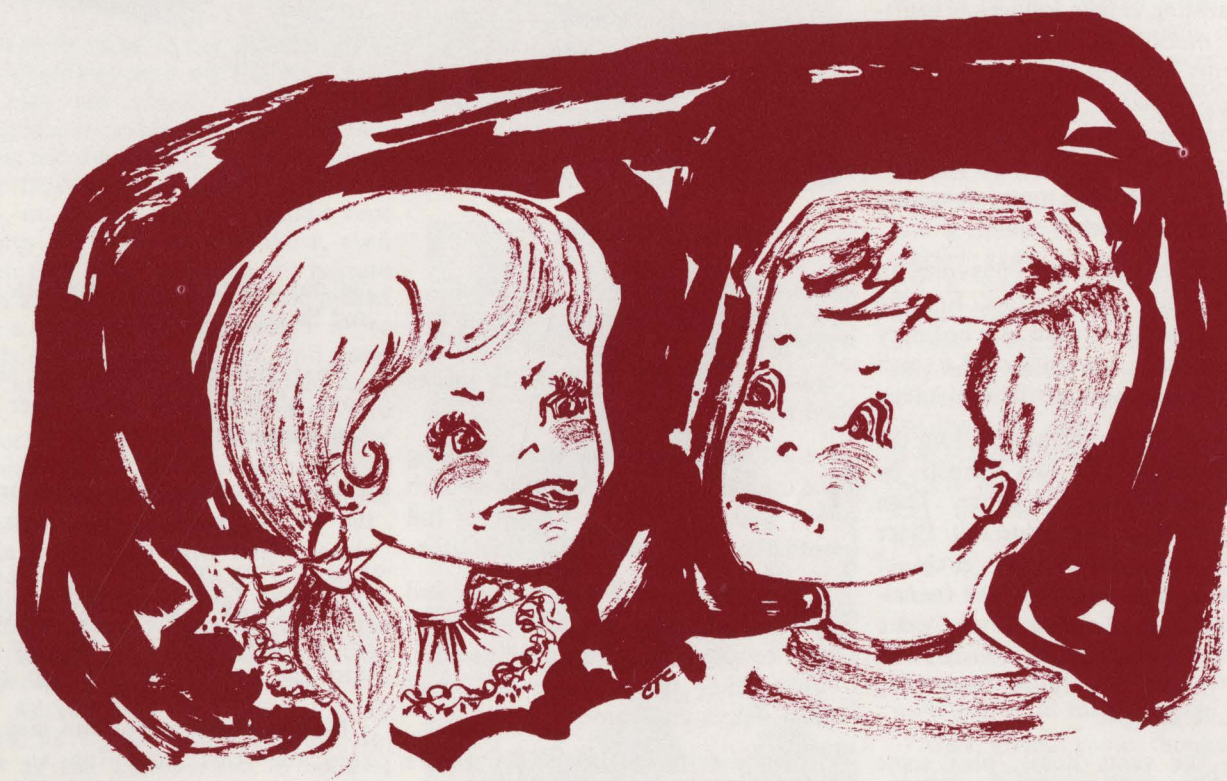
The boy then searches for a proper place for the burial. He selects a spot which will never be torn up by a plow and a place where he thinks people will never come. So he digs a grave on the top of a small elevation which overlooks the little valley with a view of the school house in the distance. He thinks the letter ought not come in contact with earth. The best container he can think of is a small basket made of burdock balls. The letter is reverently placed in such a basket and the basket put in the grave. On the level of the ground above the burdock container he places a sheet of glass through which the love letter may be seen. But the boy is sure it is in a place where no human eyes except his own will ever look. He does not mind if birds and wild animals sometimes come there to look.

Then he erects a small headstone to mark the grave. And thus the love letter is buried.

From time to time he visits the grave. In time he sees that grass has covered the glass. Then comes the time when he finds the head stone has fallen. But all is well.

This is the end of the first communication the boy has with a girl. It is to be full two decades before the boy again has a communication with a girl in his age group.

Bertha did not marry either Ellery or Halsey when she grew up — she married Ellery's older brother. Ellery never told her about the letter. Editor.



Making Valentine Decorations

A sparkling candle holder—a heart-shaped mobile—festive Valentine ornaments—these are just a few of the easy-to-make Valentine decorations the whole family will have fun creating. The cost is just pennies, and what could be more charming for a Valentine party?

Alcoa's designer Conny has come up with these easy decorations. For the candleholder you'll need two ordinary kitchen funnels, aluminum foil, a small foil pie plate and artificial violets.

To make the candleholder, join the spout ends of the two funnels by forcing one inside the other. Then cover them with aluminum foil. Place a small foil pie plate or circle of heavy duty foil on top of the funnel-candlestock. Cut a hole in the plate and insert a tall candle. Crushed foil placed in the top funnel will hold the candle upright.

With the same items, plus some ribbon, you can also create a lovely heart-shaped mobile. The mobile is made by lightly crushing a piece of



Alcoa Wrap aluminum foil about six feet long. Begin crushing foil at one end of the length until there is enough crushed to make a circle 18 inches across.

Continue around the circle, tucking the crushed end in against the smooth foil, and add layer on layer of foil until the entire length has been used.

Bend this into a heart shape and decorate with the artificial violets you have remaining from the candleholder, some ribbon, green leaves and small petal shapes cut from foil.

To add extra touches here and there in your table setting, small hearts can also be made by crushing and shaping aluminum foil, or they can be

cut out of a thin sheet of plastic foam and then covered with foil.

Next, cut two large heart shapes from plastic foam and cover with dark purple foil gift wrap.

To make an arrow that goes through the two large hearts, take four pipe cleaners and wrap each one in aluminum foil. Bend three pipe cleaners into V's and glue to the end of the fourth. The arrow can then be stuck into the center of the top heart.

Making these decorations may even keep the kids busy for an entire afternoon...and turn their Valentine Party—or yours—into a real hearty affair!

My First Romansie

by
Vernie Larson Swenson

When I was a little girl of eleven (that would be about 60 years ago) I had my first real crush. I lived on a farm in Minnesota and went to a small one-room country school. I had just been introduced to romance by being kissed by a boy for the first time. Walter Johnson did it on a dare from the other boys. I made a great show of running fast and hard, but got caught as I was crawling under a barb-wire fence, and he kissed me soundly on my left ear. Anyway he liked another girl better, so I couldn't feel too thrilled at the experience. I had my own big love interest, however. His name was Eddie Johnson and he came one day to visit his relatives near by. It was most gratifying to have him single me out from the rest and make no bones about it. He was cute looking, and besides he was from the big city of Minneapolis which made him out of the ordinary.

Once he came to our farm to spend the whole day with my brother Kelly. His visit was looked forward to, and I was tacitly made to understand that I was not expected to tag along whatever they did. To Kelly's surprise—and, no doubt, chagrin—Eddie kept asking me to come with them, even when they went down to the pasture to play along the lake. Eddie picked me a handful of wildflowers—to Kelly's bewildered disgust; and made an extra sling-shot so I could have one, too. Then because I refused to shoot at birds—with a fine show of virtue—Eddie said he didn't want to shoot at them either. We compromised by aiming at butterflies.

Kelly, I think, was sort of disappointed in Eddie's visit; but I had a memorable day, feeling myself admired and sought out. I pressed his flowers in between the pages of the big Medical Adviser in a very glow of sentiment, as I had seen my sisters do, and as the heroines did in books I had read.

Eddie returned to Minneapolis, and I waited in suspended animation to

see if he would write, as he had said we should do. And, yes, he did write. He wrote several times. I seated myself formally at our combination bookcase and writing desk to pen each reply—

With the coming of his letters, alas, there had also come a sense of disillusionment: Eddie was not quite the romantic knight in shining armor I had created in this my first flush of first romance; he was a very human little ordinary boy who couldn't spell. For how could romantic sentiment continue to be nurtured on messages such as these, though they continued coming faithfully into the late fall:

"I don't think you wood no me now. I have groan so talle, I ware longe pans... The big boys and girls had a partye last nite. We kids sate on the stares and trowed spittballes at them. Wusnt we bade boys?"

Eddie again came to visit after two years. Oh yes, spelling or no spelling, he was charming and handsome. And faithful! For he made it clear for all to see that I was still his "girl". He came to our school each day until the



end of our term, not taking part in our lessons or spell-downs—so his spelling didn't show. And he came along to our last-day-of-school picnic which had been organized at a wild grove of trees. We wandered off, Eddie and I, from the rest. We picked flowers and brought our bouquets back to lay them on the luncheon cloth for decoration when it was time to eat. It was well into the summer, after the school was deserted, that someone passing by our school house, discovered something written on the outside East wall of the school: two hearts had been drawn, the space of a couple of feet apart; on one were the initials V. L.; on the other E. J.; and beneath the festoon of links connecting the two, was the inscription: "A golden chain bines ore harts."

To be sure, I was secretly flattered at this public declaration of affection—despite the spelling. I could have wished he had carved it on a tree—that would have been truly romantic! But, of course, there were no trees about that didn't belong to somebody's grove; and I guessed he had wanted me to see it, and all the other kids to see it. I hoped the rain wouldn't wash it away now, before everybody had a chance to notice it when school started again in the fall! But then I got a nagging little feeling—like about "fools' names and fools' faces"—always being seen "in public places". So, with honest reluctance I gathered a fistful of dry grass and scrubbed out the V. L. and the E. J. And when I wrote to Eddie, I put a postscript on the letter to say that "someone" had written something on the east wall of the schoolhouse, and had he seen it? For, all at once I thought what if someone *else* had written it there for a joke! And then he wrote back, "If you wode radder the kids shunt see whut I rote on the schule wall, you coud raitz it mabe?"

After giving some thought to the general situation, and reading over that last communication, this honorable, studious little girl finally decided that she had *had it*. Good-bye Eddie.

History's Great Love Stories

Do you know what lifelong love affair started when the girl was "given away" by her former lover "as a Christmas present?"

Whose 14-year-old betrothal to the girl he loved ended seven years after he was tricked into marrying her sister?

Who had the shortest love affair in history—and who had the longest?

The "Christmas present girl" was Lara, heroine of MGM's movie, "Doctor Zhivago." Lara, unwillingly involved with a man she doesn't love and desperate to break the thing off, marches into

a Christmas ball and wounds her lover with a pistol. He lives, but finds his ardor dampened by the incident, and tells "Doctor Zhivago, "I give her to you as a Christmas Present."

If Doctor Zhivago and Lara's love affair became one of the deepest and most enduring, who had the shortest infatuations? Odds are, it was the crazy mixed up people immortalized by William Shakespeare in "A Midsummer Night's Dream."

As you may remember, two men loved one girl, and another girl loved one of the men. The fairies of the forest, who seemed to have believed that emotional difficulties could be treated by pills and such concoctions, mixed up a kind of instant preparation to straighten things out. The result? People woke up overnight to find themselves in love with somebody else! Oddly enough, however, it was only an innocent bystander, Bottom the Weaver, who was made foolish donkey, and even this episode ended happily.

In contrast to such instant and

short-lived infatuations, consider the longest love affair—Dante's and Beatrice's, existing unchanged throughout all eternity and the rigor's of Dante's trip through hell. Modern wives who complain that their husbands are away too long on business trips should certainly sympathize with her.

Beatrice, however, doesn't get the award for Most Patient Woman. This goes to Penelope, wife of Ulysses, who for seventeen years held other suitors at bay awaiting his return. Being pressured to choose a lover (who could then take over Ulysses' domain) she held out on the grounds that she must first finish her weaving, which she did during the day, then unraveled during the night.

Would a man have had such patience awaiting his beloved? Jacob, of Biblical times, fell in love with Rachel who was guarded by a father with an eye to his labor problem. If Jacob would work for the old man seven years, he was told, Rachel would be his.

Jacob put in his time, but at last when he lifted his bride's veil after the ceremony, he found he had wedded not Rachel but her sister, Leah! Seven more years were required to win Rachel, too. Eventually they were married, after Jacob had fulfilled what must have been the worst labor contract in history.

While many men declare that they would go to hell and back for their beoved, only Orpheus of Greek mythology did. Unfortunately, he was unable to resist the temptation of looking at his beloved Eurydice on the way back as he had been warned, and she vanished.

(Continued on Opposite Page)

Ancient Valentine

Dear Friends:

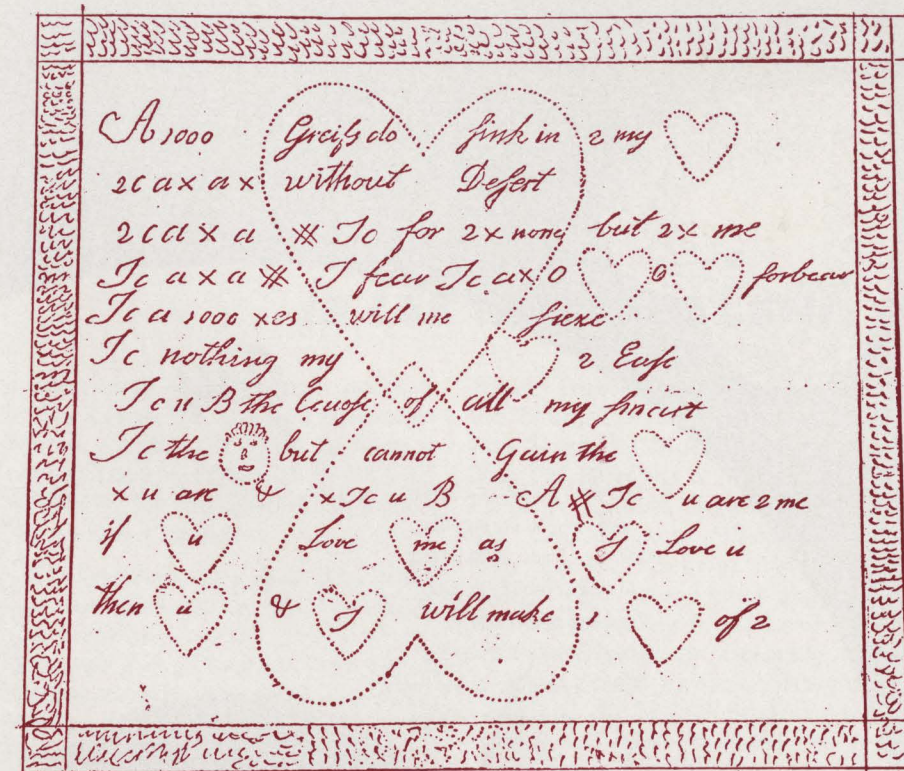
I have just received a Valentine and message from dear Granddaughter Marian.

This reminded me of the Valentine I have had since I was a small boy. It was made in 1787 evidently by the use of a quill pen. I made a sketch of it and sent it to Marian thinking she might like to see what was done along this line before Valentines were printed and put on sale for those who wanted to send one.

And I gave the interpretation I made of the exact meaning of the lines. The following is my interpretation.

A thousand griefs to sink into my heart
To see across a cross without desert
To see across a double cross, I see for to cross none but to cross

The most famous lovers of all time, Romeo and Juliet, were not only the creations of Shakespeare but real people—and visitors to Italy today now have Juliet's balcony pointed out to them. The earliest known account of this story, by the Italian writer Luigi da Porto, was written about 1530, but he claimed that the story had been kicking around as early as 1303. It was later published in a collection of Italian novels in 1554, and was translated into French in 1559. Shakespeare wrote his version in 1596, and perhaps the last version is the Broadway musical of several seasons ago, "West Side Story."



One of the first valentines in the New World—made with a quill pen almost two centuries ago.

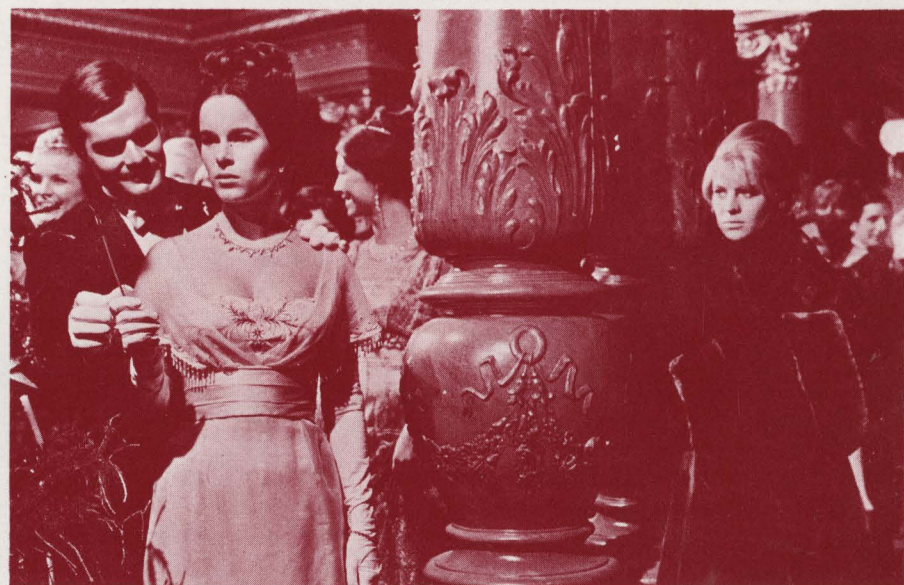
me.
I see across double cross, I fear I see a cross, Oh heart, Oh heart, forbear.
I see a thousand crosses will me sieze
I see nothing my heart to ease
I see you be the cause of all my smart
I see the face but cannot gain the heart

Cross you are and cross I see you be
A double cross I see you are to me
If you in heart love me in heart as I in heart love you
Then you in heart and I in heart will make one heart of two.

Love to you all from

ELLERY B. PAINE

A Scene from Doctor Zhivago



Dante's Meeting With Beatrice

Notes on the

NATIONAL MEETINGS

in Los Angeles, Calif.

Joy

1. The fields are full of Poppies,
and the skies are very blue,
By the Temple in the coppice,
I wait, Beloved, for you.
The level land is sunny,
and the errant air is gay,
With the scent of rose and honey;
will you come to me today?

2. From carven walls above me,
smile lovers; many a pair
"Oh take this rose and love me!"
She has twined it in her hair.
He advances, she retreating,
pursues and holds her fast,
The sculptor left them meeting,
in close embrace at last.

3. Through centuries together,
in the carven stone they lie,
In the glow of golden weather,
and endless azure sky.
Oh, that we, who have for pleasure
so short and scant a stay,
Should waste our summer leisure;
will you come to me to-day?



4. The Temple bells are ringing,
for marriage month has come.
I hear the women singing,
and the throbbing of the drum.
And when the song is failing,
or the drums a moment mute,
The weirdly wistful wailing
of the melancholy flute.

5. Little life has got to offer,
and little man to lose.
Since to-day Fate deigns to proffer
oh wherefore, then, refuse
To take this transient hour,
in the dusky Temple gloom
While the poppies are in flower,
and the mangoe trees abloom.

6. And if Fate remember later,
and come to claim her due,
What sorrow will be greater
than the Joy I had with you?
For to-day, lit by your laughter,
between the crushing years,
I will chance, in the hereafter,
eternities of tears.

Laurence Hope

For the second time in Eta Kappa Nu history, the National Board of Directors, convened the semi-annual board meeting in Los Angeles, California, on August 24, 1966.

Following the meeting, the board was honored at a garden party at the hillside home of Brother and Mrs. Stuart McCullough in Encino. This opportunity to meet with the active Los Angeles Alumni Chapter was attended by 71 persons, including President and Mrs. Clyde Hyde, Vice-President and Mrs. William Smith, Executive Secretary, Paul Hudson and two daughters, Immediate Past President, Howard Sheppard. The eight National Directors, five of their wives and nine of their children were present, and forty-one local brothers, wives and dates.

On August 25th, the board participated first in the induction of our new Eminent Member, Dr. Simon Ramo; then in the presentations of the second annual Outstanding Electrical Engineering Student awards. These were presented at the Eta Kappa Nu Awards Luncheon at the Statler-Hilton Hotel in Los Angeles, sponsored jointly by Eta Kappa Nu and WESCON.

The board meeting was scheduled to coincide with the week-long Western Electronics Show and Convention (WESCON), which is the major annual electronics exhibition on the west coast, attended by about 45,000 electronically-oriented persons. It is co-sponsored by the Western Electronic Manufacturers Association (WEMA) and the Institute of Electrical and Electronics Engineers (IEEE), and is held alternately at Los Angeles and San Francisco. The stature of this event in the electrical-electronic community, the very appropriate group of attendees, and the large attendance by Eta Kappa Nu alumni,

in addition to the recognition accorded to Eta Kappa Nu, led the Los Angeles Alumni Chapter in 1964 to form a semi-permanent arrangement with WESCON for our annual Eta Kappa Nu Awards Luncheon.

The luncheon is an auspicious occasion for presentation of the plaque and certificates which represent the Outstanding Electrical Engineering Student awards. The 1966 award was presented to Mr. Thomas Luther Thomas, recent graduate of Ohio State University with both BS and MS Degrees. It was also possible for two of the three Honorable Mention winners, Mr. Martin Edward Hellman of New York State University and Mr. David Ellis Wolf of Carnegie Tech to be present to receive their certificates and appropriate public recognition. The third recipient of an Honorable Mention award, Mr. Charles Joseph Zuercher of Marquette University, received public recognition of this accomplishment and award, but was unable to be present. A later occasion will be selected by the Executive Board for a formal presentation. The qualifications of these outstanding young gentlemen and brothers are covered by separate articles.

Honored guests at the luncheon, in addition to the award winners, Eminent Member Dr. Simon Ramo, and the national officers and Directors, were William E. Murray, President of the Los Angeles Alumni Chapter (Mu, 1947), who also assumed the role of Master of Ceremonies; Edward Wagner, Jr. (Upsilon '55), Vice-President and luncheon chairman, Trevor Hendershot (Upsilon '57), Secretary, Bearl F. Dennison, Treasurer, involved in around-the-clock testing of the Surveyor program at Hughes Aircraft Company, was not able to be present. Other guests were Thomas L. Rothwell, recently a Western

Region Director and who also directed the Eminent Member induction team; Mr. Hugh P. Moore, Chairman of Board of Directors of WESCON; Mr. Ralph A. Lamm, Chairman of Executive Committee of WESCON; Mr. Don Larson, General Manager of WESCON, who rendered major support and assistance to the Los Angeles Alumni Chapter in arranging these events; Brother Lawrence Hamilton, Chairman of the 1966 Student Award Committee, who presented the Jury of Award and outlined the objectives of the awards program to the attendees; Mr. Lee A. DuBridge, Eminent Member and member of the 1966 Jury of Award, Mrs. Thomas L. Thomas, wife of the 1966 Student Award winner, was present to share in this significant moment in the life and career of her husband.

After introductions and a brief outline of the objectives and procedures of the student award program, each winner was recognized by a summary of his qualifications. President Clyde Hyde then presented the plaque and certificates in a manner that emphasized the national significance of these awards. After summarizing Dr. Simon Ramo's achievements, an Eminent Member Certificate, key and badge were presented to him by Dr. Clyde Hyde. Dr. Ramo expressed appreciation for the award and spoke on engineering vs. science vs. humanities in the education of engineers.

It was concluded that profitable and pleasant meetings, activities, and social events were enjoyed by the national board during the two day conference. That these proceeded without incident or perturbation attested to the fine planning and preparations by committeemen and officers of the host Los Angeles Alumni Chapter.

(Photos on next pages)



IDENTIFICATION: Top left-- Lee DuBridge--Henry Ablin. First row, L to R--Martin Hellman, Clyde Hyde--Finley Tatum, Jack Farley, John Hancock--Simon Ramo--Paul Hudson, Clyde Hyde, William Smith--Carl Cooper, Mrs. T. L. Thomas--Simon Ramo, Clyde Hyde--Second Row--Tom Rothwell, William Smith--Warren Jessup, William Murray--Martin Hellman, Clyde Hyde--C. Holmes MacDonald, Jack Farley--Clyde Hyde, Mrs. T. L. Thomas--William Murray. Third row--Clyde Hyde, David Woolf-- Edgar Markard, Anthony Gabrielle--John Hancock, Henry Ablin--Thomas L. Thomas, Clyde Hyde, William Murray--Lee DuBridge, Lawrence Hamilton, David Woolf, Hugh Moore--Lawrence Hamilton. Lower right-- Hugh Moore--John Engle--William Bonser.

smile .. you're on

YOU KNOW WHAT



Eta Kappa Nu · WESCON

Luncheon · Los Angeles



NEW CHAPTERS AT

Delaware

The Epsilon Omicron Chapter of Eta Kappa Nu was installed at the University of Delaware, Newark, Delaware, on May 20th.

The installation team included representatives from each of the three college chapters in the Delaware Valley Area, the Philadelphia Alumni Chapter, and The National President.

Following the ritual and group dinner, in the Delaware Student Center, Howard H. Sheppard, President of Eta Kappa Nu, presented the charter of the newly formed chapter to Dr. Edward W. Comings, Dean of Engineering, University of Delaware.

W. Morris Cassel, Past President of the Philadelphia Alumni Chapter, a member of the Engineering Department of Philadelphia Electric Company, gave the principal address, entitled "The Challenge of the Power Industry," bringing to the attention of the students the great changes required by the rapidly growing power industries. Brother Cassel's son, William R. Cassel, together with William C. Wagner, Chairman of the I. E. E. E. Student Branch and Robert N. Spencer, newly elected President of the Chapter, were all active in organizing the Chapter. James F. Bennett was elected Vice-President and Kenneth S. Proud, Secretary & Treasurer of the Chapter.

It was unfortunate that one of the students, Philip Roger Shoop, and third in his class, became seriously ill earlier in the semester. His critical illness prevented him from being present at the initiation on the Campus. He was initiated by the student members of the Chapter at his home on Tuesday night, May 24, 1966. He, and his family, deeply appreciated his becoming a member of Eta Kappa Nu, and he stated he was looking forward to returning to the University of Delaware next Fall. Most regrettably, he died June 3, 1966, only ten days after his initiation.



LEFT TO RIGHT: Professor Lawrence F. Jelsma, University of Delaware and Professor Joseph J. Hicks, Villanova University, faculty advisors; John Kent Smith, President, University of Pennsylvania Chapter; Professor Milton G. Young, Professor of Electrical Engineering and Chairman of Department, University of Delaware; Howard H. Sheppard, President, HKN; William R. Cassel; Lester H. Fink, President, Philadelphia Alumni Chapter; W. Morris Cassel, Past President Philadelphia Alumni Chapter; Professor Martin N. Kaplan, Faculty Advisor, Drexel Institute of Technology

Wichita

The Eta Kappa Nu Epsilon Xi Chapter was installed at Wichita State University on May 22nd. At the time of the installation 21 charter members were initiated and five faculty members.

The installation team consisted of 10 representatives from Kansas University and Kansas State University. Representatives from Kansas University and Kansas State University included their faculty advisors and student presidents. Dean William P. Smith of Kansas University and Member of the Board of Directors of Eta Kappa Nu was the installation officer.

The installation was followed by a banquet with members of the installation team, local representatives of Eta Kappa Nu, President Linquist and Dean Rhatigan of Wichita State University and guests.

The luncheon speaker was President Lindquist. His excellent talk was a challenge to the engineering profession to continue to contribute to the advancement of technology for the welfare of the social world.



LEFT TO RIGHT: Dean William Smith of Kansas University and Member of the Board of Directors of Eta Kappa Nu; Professor Rummer, Faculty Advisor at Kansas University and Professor Dunn, Faculty Advisor at Wichita State University. BACK ROW: Mr. Jeff Bellack, Student President at Kansas University; Mr. Keith Hanneman, Student President at Kansas State University; Professor Ward, Faculty Advisor at Kansas State University and Mr. Robert Lynn Mueller, Student President at Wichita State University



LEFT TO RIGHT: John Cochran, Robert Smith, Ken Simpson (faculty), Fred Watson, John Blakely, Ted Carlson, Stuart Lane and Richard Swaney. BACK ROW: Ben Cantrell (faculty), Lynn Mueller, Stan Chilcott, William Ford (faculty), Roy Norris (faculty), Jim Stuart, Gaylord Brockway, Chester Kielar, Jon Casperson and Robert Spring (faculty)

WHO'S WHO IN ETA KAPPA NU

Mr. Clifford A. Faust, 28478 Pebble Beach Drive, Sun City (Los Angeles), California has been one of HKN's most active members for many years. In honor of his service to the Association he has recently been made an Honorary Active Life Member of the Los Angeles Alumni Chapter. Brother Faust served on the National Advisory Board (1937-39). He was National Vice President (1934-35) and National President for two terms (1935-37). During these years he helped develop the *BRIDGE* life subscription plan and initiated a long range expansion program. He assisted with the installation of Beta Alpha at Drexel Institute of Technology, Beta Beta at Polytechnic Institute of Brooklyn, Beta Gamma at Michigan College of Mining and Technology, Beta Delta at the University of Pittsburgh, and Beta Epsilon at the University of Michigan.

Brother Faust served in all of the offices of the New York Alumni Chapter and was elected President in 1933. He initiated and helped develop the Chapter Activities Award which recognizes the outstanding college chapter each year. Upon moving to



California he has assisted in the work of the Los Angeles Alumni through the years.

"Cliff" as he is known to friends was Associate Editor of *THE BRIDGE* for two years and wrote many articles for publication. In addition, he received Honorable Mention in the 1937 Eta Kappa Nu Recognition of Outstanding Young Electrical Engineers in the United States. Eta Kappa Nu is in itself honored by having outstanding members like Brother Faust.

and combined both these skills to work in the area of rehabilitation. He was able to dramatically demonstrate the usefulness of technical skills in the field of medicine.

CHAPTER NOTES

Last semester's program in the Beta Epsilon Chapter focused on job opportunities for the EE graduate. The semester began with a discussion of research positions available here on campus. Dr. Butler, Director of Cooley Laboratories on campus, discussed in detail the activities available for graduates and undergraduates. At a later meeting, representatives from industry came together to discuss "What is expected of EE graduates in Industry". The panel was moderated by our Director of Engineering Placement, who knew well the problems facing the graduating students. There were four diversified companies represented: Applied Dynamics, Spartan Corp., King Seeley, and Burroughs Corp. Finally, the final meeting was planned to be an example of the novel areas of employment open to electrical engineers. Mr. James Cockrill talked to our group at the Rehabilitation Center of the University Hospital. Mr. Cockrill, who began his career as an electrical engineer, later studied medicine

FROM THE MAIL BAG

My Dear Mr. Hudson:

I especially enjoyed leafing through our son's *BRIDGE* this month. I want to commend you on your selection of *Christmas Customs*, *On Covetiousness*, and *I Found God*. Poe would agree with Mr. Fulkerson that metaphors are not always the best method for conveying ideas. *Education for the World of Tomorrow* brings us back to *terra firma* again. All in all, you have published a well-balanced Christmas issue.

With best wishes,
Mrs. Jos. S. Crupi
Washington, D. C.

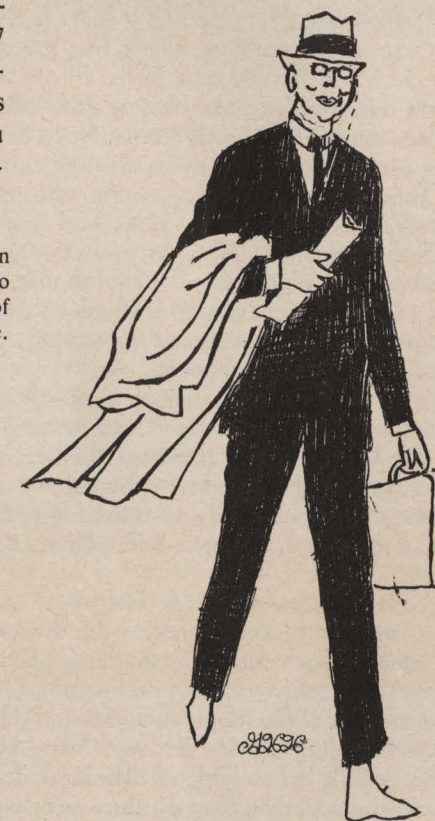
AWARD DINNER

DATE: Monday, March 20, 1967

PLACE: Belmont Plaza Hotel, Lexington Ave. and 49th St., New York City.

TIME: Cocktail Hour — 6:00 p.m.
Dinner — 7:00 p.m.

RESERVATIONS: \$6.50 each. Students and ladies half price. Make checks payable to N. Y. Alumni Chapter of Eta Kappa Nu. Mail to: Mr. Edgar W. Markard, Radio Corporation of America, 75 Varick St., New York, New York 10013. Tickets will be held for pick-up at the door. All interested persons are cordially invited.



THE OLD PROFESSOR SAYS: People who are lofty without being noble usually end up living in a loft.



The Great Sahara Mousehunt

Catherine Collins
and
Miggs Pomeroy

17TH MARCH

THIS MORNING WE set off for Kufra, an oasis seven hundred and fifty miles from Benghazi. We really feel now that we are on our way deep into the desert. We stop first at the seismic camp to pick up Catherine's passport and the carnet for her car. Perhaps both she and Alan had a psychological block about remembering them yesterday. Catherine says that she found Alan sitting up glumly in bed, his leg propped on a pillow, a whisky glass, a bottle of aspirin, and two inches of cigarette ash beside him on a box clearly marked 'Dynamite'.

Now the desert is hard and as smooth as a race-track. In car No. 2 Catherine drives for a while. She does not like desert formation. Accustomed to driving in New York traffic, she says the lack of a road-bed, signs and jostling humanity confuse her. In this expanse of nothing, where five solitary cars are racing along, she is for the first time in her life afraid of running into someone. Her fears are not entirely unfounded, for every now and then one car will break formation to chase off after a migrating bird or to follow the trail some animal has left in the sand. There is no telling, she decides, who is going to turn unexpectedly across your bow. Hank says that she is doing fine, and tells her when to shift gears, and she thinks crossly that her son and husband do that same thing but that at least she can talk back to them. There is a haze of green on the desert. Hank says that it lasts about six weeks and shows how, with irrigation, the desert could be made to blossom.

The air is brilliant, the temperature comfortably warm. We see mirages—lagoons and bays and waving grasses. The cars ahead are reflected in each mirage they cross, and we are surprised not to see them send up a fountain of spray. Yet when we approach the spot the body of water has gone, replaced further on by an inland sea, complete with islands and lonely blue headlands.

Francis has given Catherine and me a lesson on the use of a sextant, and navigation in general. He thinks it highly doubtful that Catherine has understood anything. She is very much in the dark ages about the wonders of the world. She is satisfied with a simple concept of the moon going around the earth and the two of them whirling around the sun. Stars, planets, nebulae and galaxies delight her to look at. She does not even want to contemplate the fact that they do their whirling on schedule in a sort of infinite orchestration of time and space. She listens for a

while and then wanders away looking bemused. I too am quite fuddled about it, but don't want Francis to suspect. He has charts and tables, and after much complicated adding and subtracting and reference to at least three different volumes, he finishes his demonstration by drawing two perpendicular lines on the map saying, 'Here we are!' His pencil rests somewhere in the middle of the Mediterranean, so he starts all over again.

As Liv explained it to me, navigation in the desert is much like navigation at sea, though the horizon does not rock about and one can use a theodolite rather than a sextant. With a theodolite you have an almost perfect and fixed horizon; an advantage, as you can shoot late at night. Actually we have a bubble sextant. This is not as accurate as a theodolite but has the advantage of always giving the navigator a perfect excuse for being ten to twenty miles off. We have no altimeter, and if in the desert you don't know your altitude the best navigator can be thrown off. I never did hear mention of altitude, and scented in our navigation an aura of incantation and crystal ball. Unfortunately in this day and age navigators seem to be trained to follow a formula without being expected to understand why, so when one thing goes wrong, as it is bound to now and then, we may well find that according to our navigator we are behind the Iron Curtain. Still, Catherine and I are impressed with the arithmetic involved, let alone the interpretation of it.

There are many landmarks and cairns throughout the desert, at times too many. If you are not careful it is easy to mistake one set of them for another which may be ten miles to one side and headed in quite a different direction. It is as though our road and route signs at home were unmarked posts and there was nothing to say where they were leading. In the desert it is important to start out with the best available map without ever quite trusting it. As Alonzo Pond, co-author of *Desert Survival*, says, maps of the Sahara have been known to be as much as two hundred miles off the mark, sometimes record non-existent sites or alternatively do not show a clearly visible trail. Hank has brought along some aerial maps, and Alan has unearthed French maps which are more detailed than any that have been done up to this time. Francis marks these, carefully keeping an accurate record of mileage and direction of travel. He is for ever to be seen sitting on the top of his speeding car, his torso bare to the sun, his hair on end and a map flapping in the wind. Already his maps are much spliced and taped up, and the dry air has made them brittle. But he has a good tan.

We were, and continue to be, against taking guides. In the Sahara they have the reputation of being able to let the sand run through their fingers, sniff and tell you where you are. It is a dangerous fallacy, and often means that they are lost themselves and trying to stall off your impatient questions, or seeing if they can get a tiny hint from Allah as to where on his earth they may be. We suspect that all this filibustering really tells them is that it is indeed sand. Many desert guides go by dead reckoning, camel-time, and are hopelessly confused in a car by the speed with which the familiar landmarks whizz by. They are also sometimes short-sighted, which means that from the car they have not even seen the landmark. Apart from this, they have to eat and drink and take up space, and it may turn out in the end that all they had in mind was a free ride to wherever you happened to be going. In ancient days, when a caravan was lost, they say it was customary to murder the guide before all died of thirst. This sobering thought tended to keep the boys on their feet and wide awake. But of recent years desert travellers have become lax and, like maids and butlers, guides are not what they used to be. However, if the worst comes to the worst, we can always revert to tradition and murder Francis.

We are not lost today, but Francis admits to being somewhat surprised at sighting an oil rig. We pull up to a British Petroleum camp, which has been drilling for oil in one of the most southern concession areas of Libya.

Someone once said that the junk of one generation was the treasure of the next. He was probably referring to antiques, but it might just as well have been said of deserts. A generation ago the Sahara was considered worthless, except as a route between one oasis or market and another. The Europeans, the Arabs, the Berbers, Tuaregs and Rifs fought over it for this reason, and not because they placed any value on the desert itself. Mussolini complained bitterly about Italy's 'collection of deserts', but the prediction has again come true, and the 'junk' of yesterday has suddenly become one of the great treasure-houses of the world.

Less than twenty years ago the oil of just one of the recent discoveries in the Libyan Desert might have changed the history of the world. If either side had had the use of it in 1941, the course of the war would have been far different, and, going back a step further, would Mussolini have entered the war if he had known the potential economic and political power that such a tremendous source of oil could have assured him? But of course the game of historical 'ifs' is an endless one. Although her resources may never match those of Venezuela or the Persian Gulf countries, the Sahara has already proved itself the greatest source of oil west of the Suez Canal, and in the world of finance and international politics 'West of Suez' is a far more interesting direction than that chosen by Kipling.

Nobody seems to be about at this British Petroleum camp. We look at our watches and guess that everyone must be having lunch. But we have caused a stir and soon Mr. Gibson, the camp manager, emerges from a trailer, and, with true desert hospitality, invites all twelve of us into an air-conditioned mess for a little snack of antipasto, baked noodles, steak and potatoes and unlimited beer and wine. Most of the men are French, and have those delightful heavy lids and expressive tragic eyebrows which seem to be handed out to that nation. The mess has the spirit, if not the decor, of a little *bistro*. The walls are plastered with pin-up girls which the men of our party like, and Catherine and I are told not to study so darn' closely. Mr. Gibson tells us that their well was a 'duster', a dry hole, and that the camp will shortly move a hundred miles to the east across the sand sea. We have had a lovely welcome, and are glad that he is not yet so far away.

A sand sea is a vast area where the sand is soft and blowing. Ridges of dunes, usually running north-east to south-west, cut the horizon like white-crested waves. The wind whips them on inch by inch, continually changing their contour, even as a hurricane lashes and changes the sea. Those so unwise as to cross these areas bog bumper-deep. Even the mammoth equipment of an oil company has a tough job crossing a sand sea. The B.P. camp will move to the gravel plain just south of it, very close to where the World War II bomber, *Lady-Be-Good*, lies. Her nine men finished their first and last bombing mission in that dead and hopeless land.

The *Lady-Be-Good* was discovered two years ago by a British oil-exploration crew. They came upon the plane, its tail snapped off, but otherwise in good condition, having apparently made a successful belly-landing on rough ground; at first they thought it must have crashed recently—there was no rust, no decay of any sort. The coffee in the thermos was drinkable. The clock on the panel worked. The Englishmen reported it to the American military people at Wheelus Base in Tripoli, who pieced the story together.

On 14th April 1943, in the middle of a sandstorm, the *Lady-Be-Good* took off from its base at Solluch, near Benghazi, to make a bombing raid on Naples. Of the twenty-five planes which took off, only eleven reached their target. Going north to Naples, the *Lady-Be-Good* made excellent time with a strong tail wind. When they turned for home the crew did not know that the wind had also turned, with the suddenness and strength which seems to be a peculiarity of that area. Again they had a tail wind, but this time, when they estimated their position, they figured on a head wind. They were therefore much further south than they thought. It was night, and they must have looked for the dimmed lights of their home base at Solluch. They could never have seen them, for they had long since left the Mediterranean and the North African coast behind—they had overshot Solluch and were flying over a land as featureless as the sea itself. They were four hundred miles into the desert when they began to sputter through



First Land Rover on the moon — no Russians in sight!

their last tank of petrol and decided to bail out, as they thought, into the sea. Instead they rolled over on to the hard sand and the *Lady-Be-Good*, their only hope of salvation with her radio and coffee and shade, went on alone for eight miles.

The bodies of all but one of the crew have now been found. They left a pitiful trail of hope. Parachutes cut arrow-shaped to show the direction they travelled, mask-shaped to protect them from the sun, a pair of boots, a dwindling diary. They were walking north, and covered nearly eighty miles without food and water. When they reached the great waves of the sand sea, the hope that over each crest they would see the Mediterranean must have kept them going until the life and the hope were finished.

Driving with Liv in the afternoon, Catherine takes the wheel again to give him some much-needed sleep. I am still too one-armed to drive on this rough stuff. The five cars are strung out in the desert in a rough spearhead, sometimes as much as a mile apart, but each in sight of at least one other car. A Land Rover in the distance looks like a tin can, and sometimes we race to overtake what proves to be in fact a tin can, cast out by some other explorer or by Leclerc's army twenty-odd years ago. Mistaking a hill for a cloud-shadow, Catherine fails to contour in time and hits it with an impact that sets the entire load about their ears and breaks the speedometer and mileage-gauge. Liv refrains from saying some of the many things he could, she reports, but the look he gives her is adequate; a mileage-gauge is vital in the desert, for keeping track of where you are and how far you should go before you start worrying about where you first went astray. Liv rearranges the load, takes the wheel and says mildly that sleep is polished off for him in any case. They talk as they drive along, and Liv says that he will build a house in this great peace. It will be completely surrounded by a million square miles of

beige lawn which he will never have to cut. He may have to fence it in, of course, to keep people from putting footprints all over. In No. 2 Hank is telling me about his family: his wife who is a school-teacher, his three little girls at home in Maryland and his Devon bulls and his Minks. Mink, it seems, are temperamental and delicate. I was fascinated to hear that the male has a bony penis. Hank says that his prize stud was deprived of breeding power (and I imagine his good nature) when this member broke off and got lost somewhere about the run. The Devon bulls, I was relieved to hear, are sturdier. According to Hank, museum work is sometimes tedious. Schoolchildren are given to writing innumerable letters asking for such things as 'all information about rodents'. And a schoolchild must always be answered. For Hank, field work holds the greatest charm. He has been to all three Libyan provinces. This year he expects to spend a total of six months out of the United States. He will go to Aden later, and to Ethiopia, where he will join a team working on a medical-research grant. They will study the spread of various diseases by parasites. Almost all of our men are growing beards, and Hank's is the bushy type that makes him look like the thieving prospector in an old-time Western movie. He is hard-working, kind and helpful, and knows more about the desert than any of us.

In No. 5 car Frank and Charlie are telling Francis about women. Two years older than their officer, who is twenty-one, they claim to have learned from experience. Frank says that he joined the Army to get away from a shrewish wife and has learned to keep strictly unserious with the dames—'just don't let them get a toe-hold,' he patronizes, 'and you'll be all right.'

Charlie agrees sagely. They are pulling Francis's leg badly for neither of them has been married. Charlie, really getting into the spirit of the thing, says: 'The best thing that ever happened to me was my divorce. Women! All they want is everything they see and some poor bloke sweatin' away to provide it. Take my advice, surr, and keep that young leddy of yours at a distance.'

Francis grumbles disconsolately and pops up through the hatch on to the roof of the car to scan his fleet. Despite Frank's and Charlie's jaundiced view on women he hopes for a letter from 'that young leddy' on the R.A.F. plane which is scheduled to fly our wireless and operator to Kufra.

In the late afternoon the desert commences to boil up in little hummocks topped with a weird hairy growth. Hank, who has eyes like a hawk, spots some infinitesimal tracks and holds up the convoy to examine them. Neither he nor anybody else can identify them.

'A verra sma' abominable sand-man,' John Ferguson suggests wisely. John is a cabinet-maker by trade, doing his National Service with the Army, but by choice he would be back in Scotland, stalking deer or fishing for salmon. He is a real country-man, but to me he looks more like a poet of ancient Greece, who should be wearing a toga and sandals instead of sneakers and khaki shorts. He has a lilting speaking voice, and I feel sure he can sing. His beard is not bushy, like Hank's, but Lincoln-esque.

We come to a clump of palms. This is either Bir Harasch or Bir Buzaregh—we argue about it but there is no one to ask. Bir means 'well' in Arabic, and if we need it we could dig for water. Hank and Liv set out traps. They use oatmeal for bait, chewing the dry stuff until it wads and will stick to the trap. Like cows they munch as they walk and there is no conversation. Hank marks each trap with a fluff of cotton so that it will be easy to find in the morning.

At camp, Frank and Archie get the tea going and Catherine and I consult about food. Winston has music coming over the radio of his car. His table is set up, furnished with a large white plastic bowl and soap-dish and a gallon jerry-can of water. He

is bathing. The men are variously setting out beds, sorting equipment or changing the oil in the cars. Archie digs a garbage dump under the dining-room table where we could throw eggshells, if we had eggs, and debris. Francis takes time out from his charts to protest. He tells us that it is insanitary, improper and unmilitary.

From the stove where Frank squats, looking as though he were praying to the tea, we hear him mutter, 'Wimmen arr unmilitary, I told ye so, Mister Gibb.'

But we win this little battle. 'No inhabitants, no flies!' I say, 'and we don't want to have to walk a sanitary distance every time we scrape a plate.'

It is dark. Winston has rigged a small lantern for his bath, but the large lantern is broken and we have set the big flashlight on the table. Francis keeps borrowing it to read by as his own flash is not so powerful, and we fumble blindly for pots and pans. The pots are in a canvas bag, the dishes and 'eating irons' (as the Army calls its cutlery), mugs and such in a carton. Everything is covered with layers of dust. We have brought an enormous amount of food to supplement the 'compo' ration which, although adequate for twelve men for forty-five days, would be dull fare if unrelieved. We have tins of ham and tongue, tuna and sardines, tamales and pancake mixes, fruits, sweets and biscuits. We have one carton devoted to seasonings: oil, vinegar and wine, lemon concentrate and extracts with which to disguise anything too boring or, as may be, high. We hope to be able to buy eggs and tomatoes at the oases, and to shoot gazelle. In addition to the three-burner primus we have a charcoal grill. We did not bring enough fruit and juices and vegetables and as the weather gets warmer we crave these. Dried fruits, raisins, figs and dates would have been easy to bring and a welcome relief from those incredibly weighty army productions, mixed-fruit pudding and jam roly-poly. We have brought enough whisky for an occasional tot, but had to draw the line at beer. One can apiece a day would have added twenty-three cases to our heavy load.

When the last dish has been sand-washed, the last lantern put out, we retire, each to his chosen spot, for a wash-up. These men certainly are unaccustomed to travelling with women. We decide that in future we will have something to say about the way in which the cars are squared off for camp. It is necessary to use a car as a washroom as you need a fender on which to put wash-bowl, toothbrush, mug, mirror and all of those jars of cream. Tonight there does not seem to be an unprotected side to any car. To the east Hank is already in bed, to the west Winston is rearranging his sleeping-bag, the north and south are teeming with men and in the centre Francis is taking a fix on the stars. Disgusted, Catherine and I do a contortionist job of undressing behind a blanket rigged over a car door. I have striped pyjamas which offer a good camouflage. Catherine has made the mistake of bringing white wool. Walking away from the camp to search out a convenient clump she looks fluorescent.

What do we all think at night when the last weary bone is laid to rest, the last zipper pulled up against the already penetrating cold? Even great thoughts cannot last long. The stars, as big as apples, hang out of the sky. With a ceiling over one's head one may fight for sleep, toss and turn, here one fights to keep it off. The day is done, with whatever problems or hardships or heartaches to some. Does your body ache, it is resting now. Your spirit is free as it has never been before. The stars in this immense solitude unroll all of history, and you are present at the Creation. A flash of thought that you would like to contemplate, but already you are asleep.

(Continued in next issue)

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