
TUNISIA
Tripoli
Mediterranean Sea
Tobruk
Benghazi
Agedabia
20°
Area covered by Mousehunt
Equator
ALGERIA
Gialo
LIBYA
The Great Sahara Mousehunt
Sebha
Desert
Gatroun
Kufra
EGYPT
Jebel Sherif
BRIDGE OF HKM
Kourizo Pass
Tibesti Massif
Uweinat
Wour
Zouar
Ounianga Kebir
SUDAN
REPUBLIC OF CHAD
Faya-Largeau
0 50 100 150 200
Scale in Miles

Bridge

of ETA KAPPA NU

Electrical Engineering Honor Society

AUGUST, 1966, Vol. 62, No. 4

Editor and Business Manager
Paul K. Hudson

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OUR COVER

On 13th March 1961, a group of fourteen people in six cars started from the North African coastal city of Benghazi for a trip across the Sahara Desert to one of the most inaccessible mountain ranges in the world —the Tibesti. The trip was made mostly for fun and adventure.

Liv Pomeroy, with the U. S. Information Service in Benghazi, was the leader of the expedition; he took his wife Miggs. Alan and Catherine Collins, his brother-in-law and sister, came from New York, and Randolph Churchill and his son Winston from England. Dr. Henry Setzer was collecting mammals for the National Museum in Washington. The British Army stationed in Benghazi sent six soldiers under the command of Lieutenant Francis Gibb of the Royal Scots Regiment.

The fascinating account of this desert escapade is being published serially in the BRIDGE starting on page 8 of this issue.

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

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Real and Imaginary

what your Handwriting tells about you!!!

Can a stranger tell at a glance how good you are at keeping secrets or meeting deadlines? Is there a way you can establish the personality traits of people with whom you deal? Yes, say Graphoanalysts—experts who make a scientific study of handwriting.

A lot of bunk? Many prominent people don't think so.

The first treatise on how the nature and qualities of a person can be revealed through his handwriting was written during the Rennaissance by an Italian physician. Several hundred years later a French monk, working with Alfred Binet, the founder of intelligence tests, helped establish that honesty and intelligence are indicated in handwriting.

Among the renowned psychoanalysts who attested to the validity of this theory were both Sigmund Freud and one of his students, Alfred Adler.

(Continued on Page 6)

Three outstanding ways Graphoanalysis is used in today's complex world are illustrated here: (1) Engaged couples or people contemplating business partnerships can learn about each other's true personalities by submitting handwriting samples to a Certified Graphoanalyst. (2) Graphoanalysis is considered basic training for handwriting experts whose testimony regarding identification of questioned documents is acceptable in courts. (3) Personnel counseling firms and psychological testing bureaus use Graphoanalysis along with other tests to assess character and personality of job applicants.

Spectacular new use for the versatile laser is producing true three-dimensional scenes which can be viewed from any angle as if looking through a picture window.

HOLOGRAPHY

Technical Staff
Hughes Aircraft Company

Although photography is more than 100 years old, its basic technique remains unchanged. It consists of the art or process of forming an image of a subject, by means of a lens, on light-sensitive material, which is then developed and made permanent. For the past 50 or more years, dry plates (which had superseded wet plates) have themselves been superseded by roll or cut film, as the light-sensitive material. The lens and film are both inside a picture-taking device—the camera.

To describe the operation a little more technically, it is a process for recording on film the intensity distribution of a focused image of the scene being photographed. To make a conventional photograph, we have a scene, a lens system for creating the focused image and a recording medium—the film. The most noteworthy element in the system is the film; the most noteworthy aspect of the film is that it is only sensitive to the intensity (the light strength or amplitude squared) of the incident radiation.

One thing film cannot record directly is the phase information associated with the light wave that falls upon the film. As a result, it has been necessary to use a lens to focus an image of the subject on the film if we are to obtain a recognizable reproduction.

Since film records only the intensity of the light from the scene much information about the original scene is lost. The conventional photograph cannot re-

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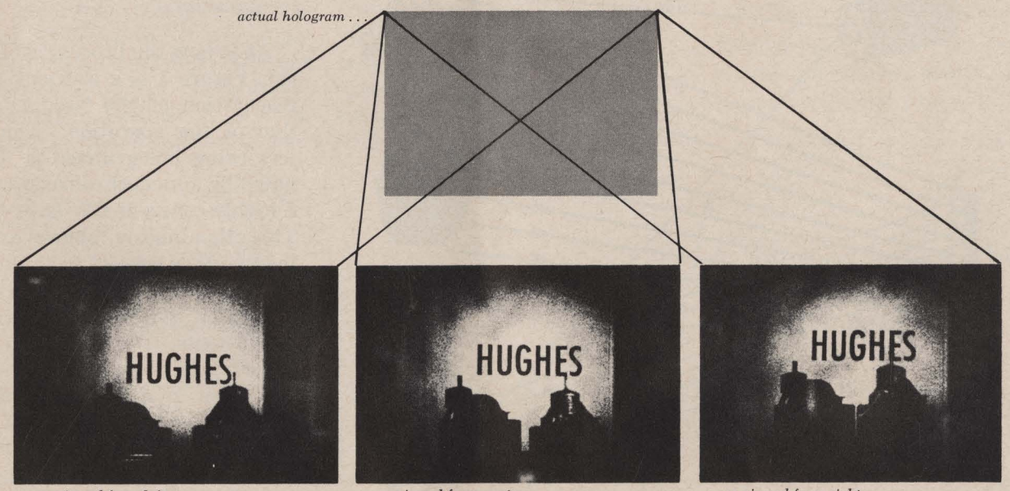


From a single hologram, and without relocating the laser source, sharp, clear three-dimensional playbacks (pictures) may be produced and various perspectives photographed. As the viewer, or camera recording the playback, moves about, objects maintain their true spatial relationships as they would appear to the naked eye.

HOLOGRAPHY (from page 3)

produce the three-dimensional character of the original scene, since the film records its projection onto only two dimensions. Specifically, the conventional photograph cannot reproduce the parallax (the difference in apparent direction of an object as seen from two different points) between near and far object inherent in the original scene. By changing position with respect to the scene, the relative position of the objects that compose the scene changes. However, no amount of moving about with respect to the photograph will change the relative position of the objects in the recorded image whatsoever.

An additional limitation is that the viewer no longer has the ability to focus his eyes selectively on the various objects in the scene. What is in focus on the photograph remains in focus and what is out of focus remains out of focus regardless of how he focuses his eyes.

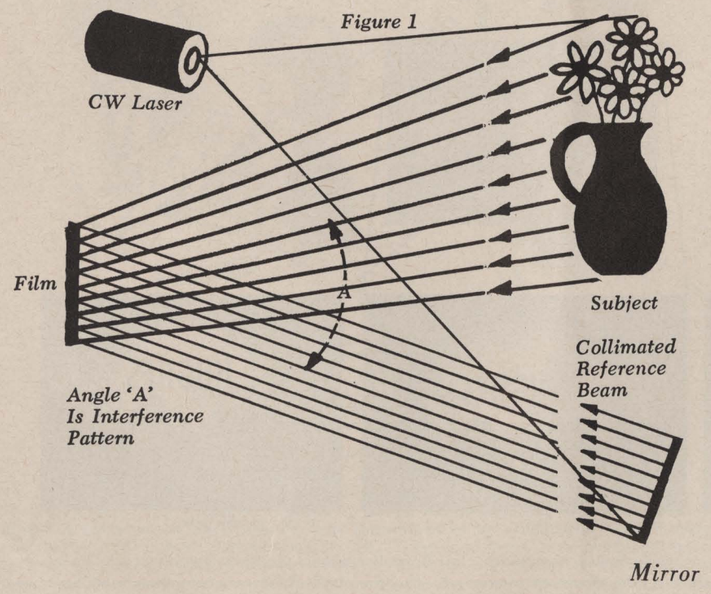
Now, all of these limitations could be eliminated if it were possible to photograph the scene in such a way that not only the intensity but also the distribution of the phase of the light emanating from the scene could be recorded. If this could be done, then it would be possible to *recreate* the original distribution of light from the scene. The viewer, looking into this light *would see the scene exactly as it would have appeared had he looked directly at the original.*

This is the goal — and the achievement — of "holography," or the process of photography by wavefront reconstruction. In this process there is no attempt whatever to record a focused image of the subject scene. Instead, by means of an ingenious technique it is possible to record or actually photograph the radiation field itself. This provides a "master" made in such a way that the original radiation can be faithfully recreated on "playback." The viewer of the result sees the photographic image *in three dimensions, with parallax, and with selective focus.*

Holography was conceived by Dennis Gabor in 1949 in connection with work he was doing in electron microscopy. The name was coined by Gabor because of the fact that the process records the whole field — amplitude *and* phase — in an *exact* reproduction of the original scene. Early attempts were handicapped by diffiiculties arising from certain limitations peculiar to electron microscopy, chiefly the fact that the holographic process involves the splitting of a light beam, an impossibility for the beam employed in the electron microscope. Thus the progress of the process was necessarily slow, and it was not until 1962 that two scientists at the University of Michigan (Emmett N. Leith and Juris Upatnieks) solved the difficulties and paved the way for recent developments.

As to how the process is carried out, Figure 1 is a schematic representation of the "taking" portion of the operation. The subject being holographed is illuminated by a monochromatic source, a highly coherent CW laser beam. This illumination, shown as falling upon the subject from the left, is really part of an initial laser beam that has been split into two components. The light falls upon the subject being holographed, in this case a still life, a pitcher with flowers, which reflects light toward a nearby photographic emulsion, as shown. No lens is used to focus the light from the subject onto the film; the reflected light strikes the film directly. For this reason, holography may truly be called "lensless photography."

Figure 1



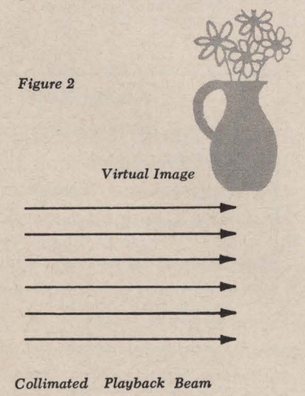
The second component of the laser beam is introduced simultaneously as a plane wave of light, a collimated reference beam, also falling upon the film, from the same side as the light reflected from the subject. This beam is placed so that it makes an angle (A) with respect to the light that arrives at the film from the subject.

Thus, there are two light beams falling on the film, and the film records the interference pattern between them. To record an interference pattern on the film, it is essential that the radiation be spatially coherent. If it were not, then the relative phase between the reference beam and the subject beam at the various points on the film would fluctuate and degrade the quality of the interference pattern. For the same reason the subject must remain still during the exposure.

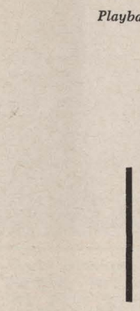
After exposure, the film is processed in the usual way, and the resulting transparency is called a "hologram." The hologram has a completely different appearance from a conventional photograph. Because it is a recording of the interference pattern it bears no resemblance whatever to the original scene. A perfect hologram would have a rather uniform gray appearance, though in practice there is a gross fringe pattern caused by diffraction from dust particles, nonuniformities in the film, or flaws in the collimating optics. The gross fringe pattern plays no part in the reconstruction or playback process; the information is contained exclusively in a modulated fringe pattern whose scale is so small that the naked eye cannot resolve it.

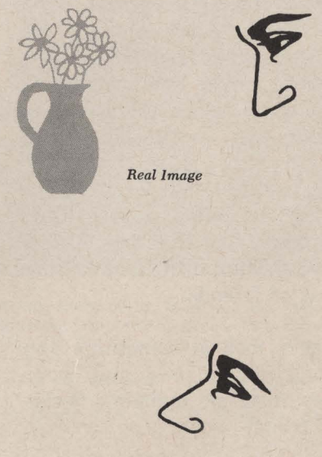
The viewing or playback system consists simply of a laser and the hologram. The laser light is collimated and passed through the transparency, as shown in Figure 2, thus reconstructing the wave fronts, and re-creating in space a three-dimensional image of the original subject. The viewer looks *into* the transmitted light. There are two images: A virtual image and a real image. To see the virtual image the viewer looks *up* at the same angle with respect to the direct beam that the reference beam made with the subject. He sees the virtual image at the same distance behind the hologram as the subject was in front of it in the taking process. He sees the image in three dimensions, with parallax and with selective focus, exactly as it would have appeared had he looked directly into the subject beam during the picture taking. The real image comes to a focus in front of the hologram and can be seen by looking *down* on the hologram at the same angle that existed between object and reference beam.

Figure 2



Configurations and Playing Back A Hologram





Hughes scientists are actively engaged in studies of holography, using the method depicted in Figures 1 and 2. The film cannot be a conventional type, that used in the current studies is Kodak 649F, black-and-white, spectroscopic, extremely high resolution emulsion. Exposures have run from 10 seconds to 10 minutes, though use of pulsed laser source has provided exposures as brief as 30 nanoseconds (30 billionths of a second). Experiments are being extended to color photography.

The potential of holography, or lensless protography, in the optical world cannot be overstated. It is particularly suitable for application to coherent optical data processing because it permits modulation of the spatial distribution of the light beam's phase;

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there has been no practical means to do this up to this time. It provides a means for lensless microscopy, and it may make possible microscope systems at wavelengths where lenses are not now available (X rays or gamma rays) or for systems where even the best lenses present significant limitations. Holography furnishes a basic technique for all three-dimensional displays, for radar, television and motion pictures, though because of the higher resolving power required by the hologram, technical advances in both electronic and photographic recording media will have to be made before the process can be used outside the laboratory.

The standard dictionary definition of photography, "the art or process of producing images on sensitized surfaces by the action of light," omitting as it does all reference to lenses or "focused images," was, thus, unwittingly prophetic in predicting the hologram decades before the advent of the laser!

REAL & IMAGINARY (from page 2)

Members of the International Graphoanalysis Society—the Chicago-based organization which serves as the international voice of the profession, research division and the educational "arm" of Graphoanalysis — are becoming increasingly enthusiastic as their day by day experiences substantiate their findings.

The International Graphoanalysis Society offers a few basic ideas that you can try out in analyzing your own handwriting or that of friends.

Take a look at something you wrote a day or two ago—your grocery list, an unmailed letter to a friend—something written with a regular fountain pen is best. Take a ruler or straight edge, follow and extend all of the "upstrokes" which you can find in a line or two of your writing. This will show you the "slant" of your writing. The slant will probably vary, but you should be able to tell if it is mostly vertical, extremely to the right, or somewhere in between. The farther to the right, the greater the degree of emotional responsiveness, say handwriting analysts. If your writing slants to the left, you probably have repressed emotions and may be an introvert. If your slant is vertical, it's a sign that you will be moved by judgement rather than strong emotions.

Now look at your m's and n's. If you make them with high needle-point tops, you probably grasp an idea quickly and are a jump ahead of the person who makes his m's and n's with round or flat-looking tops. However, this type of person is generally more thorough and methodical in garnering facts and has more of an engineering-type mind.

The way you cross your t's and dot your i's can also tell a handwriting expert a lot about you. If your t resembles a tent, for example, you have a tendency toward stubbornness. If you cross it high, you're a person with high-placed goals. Dot your i with a circle? You're an individualist with a desire to be different.

Graphoanalysis is being used in a fascinating variety of ways. Among its enthusiastic practitioners are a hospital administrator who uses it to make deci-

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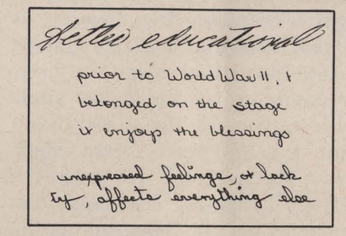
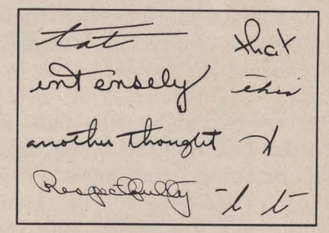
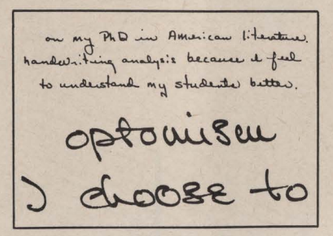


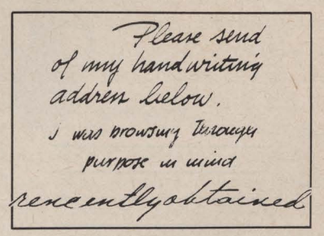
An impulsive, poised or introvert personality shows up in the slant of up-strokes in the handwriting. The farther to the right, the more responsive is the writer.



Tell-tale "t's" can show a number of traits such as enthusiasm, procrastination, sarcasm, resentment, pride and sensitiveness. The placement on the "t staff" indicates the individual's ability to plan toward a goal.



Ability to concentrate is indicated by very small writing. This trait, "concentration," also intensifies all other traits revealed in the upper writing specimen. Lack of concentration with its opposite influences is shown in the lower specimen.



Thinking habits or mental processes are important graphic signposts that handwriting analysts look for in personnel or counseling work. Keen comprehension, analytical thinking, and intuition are indicated in the above as well as other traits.

Epsilon Lambda Chapter Installed At

VANDERBILT UNIVERSITY

On Friday, April 22, 1966, the Epsilon Lambda Chapter of Eta Kappa Nu was formally established at Vanderbilt University in Nashville, Tennessee.

Induction ceremonies were conducted by Mr. Alton B. Zerby, past executive secretary of the Association, in the A. J. Dyer Memorial Room of the Vanderbilt School of Engineering. Aiding Mr. Zerby behind the black-draped induction table were brother Richard D. Bourne, faculty advisor to the Vanderbilt chapter, and brothers Homer Powell and Dr. Alphonse A. Toppeto.

Left to right: Alton B. Zerby, John R. Bourne, Prof. Richard D. Bourne

Following induction ceremonies, a banquet was held for charter members, initiates, and guests at the Belle Meade Buffet. Dean and Mrs. Robert S. Rowe and Dean and Mrs. Peter G. Hoadley were among Vanderbilt University officials attending the banquet. Mr. Alton Zerby presented a brief history of the organization following the banquet, and the evening was concluded with an address by Dean Robert S. Rowe, Dean of the Vanderbilt School of Engineering.

Initiated into membership by the Epsilon Lambda Chapter at its installation ceremonies were Drs. Fred Schumann, Larry K. Wilson, and George E. Cook, all professors of electrical engineering at Vanderbilt University. Initiates from the junior class included James R. Cheshire, James R. Onstott, Charles R. Martin, Charles E. Moore, and Robert E. Hewgley, Jr.

Left to right: 1st row: Billy B. Wise, Prof. Richard D. Bourne, Mr. Alton B. Zerby, John R. Bourne, Howard B. Johnston, Robert A. Krol, Dr. Larry K. Wilson, Dr. Fred Schumann. 2nd row: Joseph W. Demic, Robert W. Jennings, James R. Onstott, Lawrence D. White, Charlie E. Moore, Herbert H. Wilson, Joseph S. Wong, Thomas G. Hughes, James M. Heiskell, Jr., Dr. Alphonse A. Toppeto. 3rd row: Wayne J. Felts, Godfrey A. Lue, Buford R. Malone, Jr., James R. Cheshire, Charles R. Martin, Ralph N. Bussard,. Robert E. Hewgley, Dennis C. Bottorff, Homer M. Powell.

THE GREAT SAHARA MOUSE-HUNT

CATHERINE COLLINS
AND MIGGS POMEROY

DEDICATION

To our husbands, without whose unfailing impatience and churlish behavior this book would never have been written.

11TH MARCH

We are due to leave for a six- to eight-week trek into the Sahara tomorrow and everyone suspects everyone else of being disorganized. The Collinses' trunks, shipped out of New York a month ago, arrived only yesterday, having met up with a change of Italian shipping schedules which delayed their being trans-shipped from Naples, a storm in the harbour which delayed their being off-loaded at Benghazi, and Ramadan (the ninth month of the Mohammedan year, a month of fast by day and feast by night) which delayed their clearing Customs. Catherine is not desertworthy without her trunks. She has only a couple of cocktail dresses and a little sports number with her. Hank Setzer's things are packed with the Collinses' and he and Catherine spent yesterday sorting and repacking. Aside from twenty pairs of socks, Hank has brought scientific equipment, such as mouse-traps, scalpels, ammunition and cotton batting. A bottle of formaldehyde has broken, and Catherine, sniffing worriedly at her underwear, prefers Arpege. In the meantime Liv has been called to Tripoli by the deities who run headquarters there. I have seized this opportunity to give him a last-minute shopping list four pages long. The Army's yellow-fever shots have not arrived nor their permits to enter Chad. Only the Churchills are in order.

This morning I go to help the Churchills with their list of supplies, in case they have forgotten something or need help with their shopping. At 9:30 a.m. Randolph is in a shirt without trousers or shoes. He shows me his neat packages of clothes and equipment, and insists that Winston put out a camp-bed so that I can be zipped up in one of their new mummy-style sleeping-bags. He is proud of his cooler—his Magical Box, as he calls it— which he says will be kept perpetually full of ice to chill his pâté de foie gras. Ice in mid-Sahara is a novel idea, but Randolph, if anyone can, surely will manage it. Over breakfast, which Winston ate but Randolph drank, we discuss supplies and Winston decides that all he needs is deodorant. Father explodes that he's been seeing too much television, but Winston and I go shopping and buy two jars. We also buy ten kilos of charcoal for campfires.

'We shall,' Randolph says, 'sit around a jolly camp-fire and talk.' As he is a great conversationalist, we shall more likely sit around a camp-fire and listen. The first contretemps has reared its ugly head. Randolph insists that the 'other ranks' will have their own little cook-fire elsewhere. When Catherine and I protest at both the unfriendliness and inefficiency of this system Randolph's voice rises two full octaves of irritated authority.

'Don't you women go mucking up the British Army,' he cries. 'We've got a jolly good army and we don't want any American women interfering with it.'

The tense moment passes as Randolph cajoles us. 'The soldiers won't understand our jokes, you know, and we shan't enjoy their language. Let them have their own camp-fire. Every now and then we'll send them jolly little presents and converse.'

Suspicions are solidified. Everyone else is disorganized. At our house there is a marshalling of children and pets to be left with various kind friends. Catherine is sorting the four pages of shopping which Liv did in Tripoli. My arm, broken a month ago while watching a polo game, is still in a cast. It was broken outguessing a rearing horse, but everyone thinks it was gamesmanship. X-rays are not satisfactory and I will have to wear the cast for another two weeks. A pest! There is so much to be done and I am getting very lopsided. The halls are stacked with packing-cases; the children, multiplied by hordes of friends, run in and out pilfering casually from cases of chocolate or biscuits and scattering anything left in their path. The men are busy checking the cars, spare parts, sand-tracks and jerry-cans. Threading their way through the halls at meal-times, they complain loudly that there is no room in the cars for all of the stuff we are bringing. Catherine reluctantly eliminates a case of fruit juice and one of minute rice. Everyone is to regret this bit of austerity. Winston is tinkering with the Churchill Land Rover, installing a radio.

'The boy can take one of these cars apart,' his father says proudly. He ambles between cases occasionally picking up something he feels he might need. 'Just get yourself another,' he says grandly, and then, putting his arm about one of us, he coaxes, 'Come into a quieter room, dear child, and let us have a little conversation,' or, 'I must read you the jolliest little poem by Hilaire Belloc, marvellous chap.' He reads from *The Modern Traveller*. Amusing, and we think a delightful parallel to our trip. He reads beautifully. Altogether a gifted man who should have been spanked more frequently in childhood.

We cannot possibly get off tomorrow and have set Monday the thirteenth. Randolph is wild. 'We limeys,' he thunders, 'are steady on parade; but you bloody Americans . . .' He says (a) he is going back to England to

(Continued on Next Page)

Miggs Pomeroy, seeing Winston Churchill off at the Sebha airstrip

watch his tulips grow, and (b) he is starting out ahead of us. His affairs are in order. His Land Rover is tickety-boo! He roars off, singing loudly, 'When the roll is called up yonder I'll be there!'

12TH MARCH

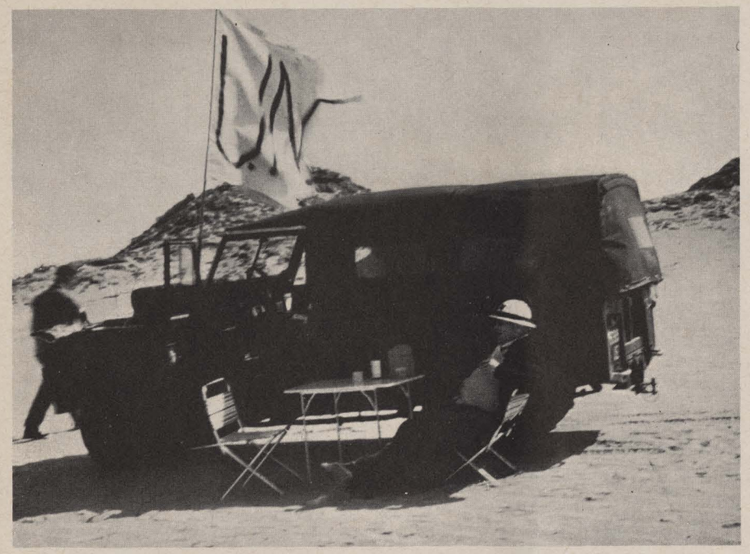
Randolph and Winston did in fact take off at dawn for Agedabia, where they have promised to wait for us. Agedabia is the jumping-off place for the desert. We'll see our last petrol-pump and our last road there. The packing-up is going forward and the extra day has given us time for detail. Alan has acquired viper and scorpion serum from the Pasteur Institute in Paris. This is supposed to be kept on ice, which despite Randolph's 'Magical Box' we are not so naive as to think possible. None of our French is up to differentiating between vipers, which we all feel would be better given international names. Something to take up with the U.N. We've heard some shocking snake-bite stories, and Catherine, who is not a nature-lover, is getting nervy. She says she doesn't mind dying of snake-bite so much as she does meeting with the snake. Everyone agrees that snakes and scorpions are nocturnal creatures who quarter the desert at night in search of diet. Also when cold they like to cuddle up in the toe of a shoe or sneak into a sleeping-bag. At one of the many farewell parties Tony Hamilton Browne, Mobil Oil of Canada representative in Benghazi and with the Long Range Desert Group during the war, tells of returning to his sleeping-bag after a late-night reconnaissance to be bitten in the rump by a viper. The L.R.D.G. had a medical man along and within one minute the viper was dead, the poison extracted and the proper serum injected. Catherine has made up her mind not to get up in the night. There are various types of vipers in the Libyan Sahara, and viper and cobra in the Tibesti Mountains. The viper's poison attacks the nervous system and the victim has exactly one minute in which to get the proper antitoxin. Liv has taken our serum along to the Seventh Day Adventist Hospital for sorting and instructions with very confusing results. He is told that American hospitals in the area have been advised to destroy all serum on hand as more people have died of toxic reaction to snake serum than have died of untreated snake-bite. There are many varieties of snakes and vipers, and if the victim has not recognized the species by which he has been bitten it is unlikely the doctor will be able to diagnose. A snake streaks at you, and if you are Catherine or me you screech and pass out. By the time you have been revived all you can say is that it was ten feet long, had green and orange spots and looked like Khrushchev. You are immediately treated for a horned-viper bite and as the snake was really a garter snake you die from the serum. As to scorpions, we are advised that few people die of scorpion-bite and that the serum is more dangerous than the bite. So some doctors now recommend waiting to see if the patient survives without the serum. A tricky bit of curiosity, we think. At a later date the French in Chad told us that the bite of a horned viper will kill you if the serum is not administered immediately in small doses every five minutes in a ring around the bite. However, Liv has brought home a batch of hypo needles and some extra-powerful vitamins for Randolph. His way of not eating his meals is worrying and we don't want him breaking out with scurvy, or whatever people get when they don't eat (aside from good figures). Mahmud Abeidi, Liv's Libyan assistant at the information centre, has taken Alan to call on His Excellency Hussein Masek, Governor of Cyrenaica. It seems unlikely that this expedition will ever get off without Mahmud. He has met planes, shepherded arrivals with all of their weird paraphernalia through Customs, manœuvred special permits where they are needed and dragged his friends back from their Ramadan holidays to open banks and offices for us. What is more, he will hold down Liv's office while we are gone, seeing to it that America's friends do not backslide into being someone else's friends. Today the Governor gave Alan a beautiful document to all his local authorities, the Mudirs and Mutaserif, asking that they help us and make us welcome to their diocese. Personally I think that anyone who can write Arabic is by nature an artist. With schools in every town and most oases, a vast population of artists is on its way. Literally translated for us, this lovely flowing script reads:

NAZARAT OF INTERIOR

The Nazir's Office
March 11th, 1961

To whom it may concern

Departing this week, group of Mr. and Mrs. Alan C. Collins from the United States of America, Dr. Henry W. Setzer of the National Museum, Smithsonian Institute, Mr. R. S. Churchill and his son Winston. R. Churchill is the son of ex-Britain Prime Minister and the well-known journalist. Mr. and Mrs. Robert L. Pomeroy the Director of the American Cultural Centre in Benghazi, Lt. Francis Gibb and six others from the British Army.



Randolph waiting for the laggards to turn up.

The group with their six cars are leaving this week for touring through Gialo and Cofra from there to Chad. The purpose of the trip is visiting, studying and adventure.

It is requested from the departments concerned that to give all the assistance needed by the above mentioned and also any facilities which they may require during their trip to the Sahara.

(Signed) Mahmoud Abu Shraida,

Nazir of Interior.

13TH MARCH

Somehow we get packed up and loaded. The take-off looks more like a gymkhana that a well-mannered expedition. The daisies in front of our house are trampled forever into the dust by milling friends and well-wishers, children careering about on bikes, bouncing on pogo-sticks and skipping-ropes, curious Arabs, dogs and goats. Yorick, our pionter, has to be forcibly ejected from the car. Piglet the dachshund looks desolate. Julia, our seven-year-old, clings to me and sobs, though she is considerably cheered with a goodbye present. Eugene, who is ten, unable to resist the audience, stunts by on his bike. Colonel O'Lone, commanding officer of the British garrison in Benghazi, who is sending a small detachment with us, can only, we think, look with pleasure on his three vehicles, every jerry-can and case of food and every soldier neatly in place. It must be a relief to him that the rest of us, rushing from house to car with last-minute remembered bundles, hugging children and restraining dogs, are not part of his garrison. In the end Liv forgets to say goodbye to the children. Late at night, by the headlights of the car, he writes to them, a letter still being mailable from Agedabia.

The hard-surface coastal road streaks like an arrow from Benghazi to Agedabia. We scarcely know what we will find at the rendevous with the Churchills. And if we had guessed at either place or condition we would have been wrong. Ahead of us, first a dot on the horizon and then looming as a road block, is a Land Rover mounted with a great six-foot flag; white, emblazoned with a blue U.N. In the middle of the road, at a formica-topped card-table, sits Randolph with refreshments laid out. Winston stands beside him with a gun at the alert. They both wear white tin helmets on which have been painted blue bands and large U.N.'s.

'Stopping all cars,' Randolph shouts as the five of us brake up. 'I've been sent up from the Congo to investigate. The U.N. is worried about conditions in North Africa. Come, come, identify yourselves.'

Assisting the Churchills in their manœuvre are two amiable Dutchmen whom they had found at a near-by oil rig and impressed into amusing—Randolph—duty. Everyone is pleasantly intoxicated and we are all in a mood to join them. A party of Libyans, travelling their humdrum way from Tripoli to Benghazi, ogle as they squeeze by, their expressions setting us all into a gale of laughter. At six o'clock Colonel O'Lone sends us a good-luck message over our radio. We reply, 'Thanks, we need it.' We do.

Everyone who heard of our expedition wanted to know where we were going and why. The first question was a matter of maps, not always accurate, and routes, sometimes never before travelled. The why had as many answers as there were members of the expedition. Liv wrote in one of those many letters which batted back and forth between Libya, England and the United States during the two years of planning and preparing for the trip:

(Continued on Page 14)

Souvenir Of The Award Dinner
Belmont Plaza Hotel—N.Y.C.
Monday, March 21, 1966

PHOTOGRAPHED ABOVE ARE: 1. DR. & MRS. EDWARD M. DAVIS, JR., The Outstanding Young Electrical Engineer of 1965; Assistant to the President, Data Processing Division, International Business Machines Corporation. 2. MR. AND MRS. RONALD S. McCARTER, Honorable Mention; Supervisor, The Bell Telephone Laboratories. 3. MR. AND MRS. HOWARD H. SHEPPARD, President, Eta Kappa Nu; Vice-President Rumsey Electric Company. 4. DR. AND MRS. WILLIAM G. SHEPHERD, President IEEE; Vice-President Academic Administration, University of Minnesota. 5. DR. MANFRED R. SCHROEDER, Director of Acoustics Speech Mechanics Research Laboratory, The Bell Telephone Laboratories. 6. MR. AND MRS. WILLIAM E. HARDING, Nominator of the Award Winner; Manager Laboratory Operations IBM East Fishkill Facility. 7. MR. WALTER K. MACADAM, Chairman of the Jury of Award; Vice-President Government Communications, American Telephone and Telegraph Company and Vice-President IEEE. 8. MR. A. B. ZERBY, Retired Executive Secretary, Eta Kappa Nu. 9. ROGER I. WILKINSON, Founder of the Award; Bell Telephone Laboratories, Inc. 10. WILLARD B. GROTH, Chairman of the Award Organization Committee; IBM.

IDENTIFICATION: Top row, LR, Sheppard—Sheppard, McCarter—McCarter, Harding—Davis. Second Row, Davis—Davis—Davis—Davis, Sheppard—Davis, Sheppard. Third Row, Davis, Sheppard—MacAdam—Sheppard—Schroeder—Schroeder. Fourth Row, Sheppard, McCarter, Davis, Wilkinson—Sheppard, McCarter, Davis, Wilkinson—Harding, Sheppard, Davis—Sheppard, Davis—Zerby, McCarter. Fifth Row, Sheppard, Mrs. McCarter, McCarter—Sheppard, McCarter, Davis, MacAdam, Schroeder—Sheppard, McCarter, Davis, MacAdam, Schroeder—Groth, Sheppard, Davis, Zerby—Sheppard, Mrs. Davis, Davis.

"In this day of great scientific achievement every considered action that man undertakes ought to have a purpose. This expedition will have none at all. We travel for adventure, for pleasure and to satisfy our insatiable curiosity about a little-known part of the world. Neither profit, science, politics nor serious work of any sort will be remotely considered. There is nothing to be gained and every chance that we shall all be lost. The Royal Scots will be allowed the illusion that they are testing a new type of vehicle—the long-wheelbase Land Rover—the operational characteristics of which are already well known to everyone else in the country. The Libyan members of the party will be allowed to examine their far-flung frontiers and mark them with neat white lines extending them in any direction they see fit. (Buseiri Shelhi, Chamberlain of the Household of H.M. King Idris, and Raoulf ben Amer, a doctor, were unfortunately unable at the last minute to come.) Scientific specimens may be taken provided they are properly prepared and eaten on the spot."

Altogether fourteen of us started out from Benghazi. Colonel O'Lone, commanding the British garrison in Benghazi, detached a young officer of the Royal Scots Regiment and six men, whom he placed under the direct command of my husband, Livingston Pomeroy. Liv's experience with the O.S.S. during the war promised that he would be able to get us out of any undue predicament he happened to get us into. Colonel O'Lone's reasons for sending these men were to test out the Land Rovers of which Liv wrote, and to give the men desert experience. Our officer, Second Lieutenant Francis Gibb, is from Perthshire. He is twenty-one, six foot, a broad-shouldered Scot, a keen but carefree soldier. He will navigate the expedition. Four of his men are fellow Scots with accents that mystify the rest of us. None of them is over twenty-three. Frank White from Midlothian is short, chunky and tough. He once said he was a weight-lifter before joining up, but never seems to be around when there are heavy boxes to lift. Frank is sandy and jovial. He is also a shocking tease and you can't tell when to take him seriously. He and Archie Aitken are assistant and sometimes chief cooks, according to whether the meals are 'compo' (British Army ration) or those unpopular little gourmet meals which Catherine and I concoct. Archie is from Edinburgh, with a lean Spanish look to him. Catherine and I think him rather gallant. Whoever is cooking, he and Frank between them brew the best steaming black tea the world has ever known. They make it in a wholesale biscuit tin and life would be bleak indeed without it. Charlie Pollock is our first-aid man, at least the Army gave him a two-week course in first aid and supplied him with a formidable box of medicines. Charlie is from Lanarkshire; fair and neatly built, he has a boyish look and wants to teach when his army service is up. He has a literary turn of mind and, as we discovered, speaks French. John Ferguson is dark but gentle looking, in contrast to the only other dark Scot, Archie, who looks more the dagger-totin' kind. John would always be kind. He is from Ayrshire, a cabinet-maker whose gifted hands help Taffy with the machinery or Hank Setzer with his 'Wee Beasties.' Craftsman Taffy Jones, sometimes called Crafty, is from Denbighshire in Wales, a superb mechanic and fitter. Most of the men grew beards and Taffy's was the curly saintly sort. I thought he looked like a man of God, but Catherine said not to be too sure. His accent was even more difficult than the Scots to understand, so we were never to know whether he was godly or otherwise. Jack Thompson, the radio operator, is a Yorkshireman. He is tall and thin and sad looking, and can coax voices out of the ether under the most forbidding circumstances. With ear-phones glued to his head, his hair perpendicular in the wind, he can, and does, like that other

Where did we pack that trap?

but chubbier Yorkshireman, Sam Small, soar away, leaving the rest of us earthbound. As the military group were detailed to take part in the expedition, they couldn't be said to have personal reasons for going, but not one of them, I think, would have given up the chance for as many days' leave.

Randolph Churchill was one of the charter members of our expedition, for he had asked to be counted in a good year before we got down to serious preparations. There is a saying that he who drinks from the Nile must always return to Egypt, so perhaps whoever gets an eyeful of Sahara sand is also forever drawn back to the desert. Randolph had his first taste of the Libyan sands during the war when he took part in one of the most ambitious and daring British raids behind the Axis lines. The time was 1942, the goal to mine ships anchored in Benghazi harbour. The raid was carried out by the famous Long Range Desert Group which had proved its worth in many seemingly impossible runs across hundreds of miles of trackless desert to strike the Axis far behind its lines. The operation was a well-planned and smoothly carried-out fiasco. The British got their truck past the German and Italian road blocks and into the city of Benghazi, where Randolph had charge of camouflaging and guarding it while the sappers made their way into the port area with rubber boats and demolitions. But the long bumpy ride across the desert had proved too much for their boats, which were so damaged by chafing in the back of the truck that they could no longer be inflated.

Now the old war-horse has come back to the desert, perhaps to see whether he can still stand up to it, perhaps for sentimental reasons, or to show it to his son Winston; but more than anything, I think, he has come back to taste the tranquility and quiet strength of this, his 'vast desaart.' Randolph is a big man with a round head and brooding eyes. For a man who says that he likes things straight and simple, he seems to have made a very interesting job of his own personality. He says that he prefers his flower garden in Suffolk to any of these outlandish places, and yet the mere mention of a distant horizon is enough to set him packing his bags. Like some allegorical beast, he combines the dragon and the teddy bear; unable to turn his back on a challenge, he is as brave and heedless as the first when confronted, or sweet as the second when he thinks that no one is looking. Winston, who is twenty, is the youthful figure of a one-day sizable man. He has that pink-and-white British complexion, with big eyebrows which give him an authoritative air.

Alan and Catherine have nothing but curiosity to excuse their presence on this expedition, except perhaps that Alan has some claim to having dreamed it up in the beginning. In the winter of 1954, the Collinses took a trip by car across North Africa from Tangier to Cairo. Of all the countries which they visited Libya was the most primitive. The roads still showed signs of tanks and bombs, and the hotel beds were no smoother, but the country fascinated them. They had good precedent for this. The Phoenicians, the Greeks and the Romans colonized much of North Africa, but they built their most beautiful cities in Libya, and of Libya they told their tallest tales. Where else were the Gardens of the Hesperides? 'The silent, dull forgetful' waters of the River Lethe? Here Herakles and Ulysses adventured, and Perseus scattered Gorgon's blood to make the desert flower with vipers. So, charmed by Libya, and haunted by their one slight brush with the desert, the Collinses came back to visit after Liv and I were posted here. Together we talked and concocted, and later from a distance we have written and cajoled one another into forming this expedition.

Alan is a New York literary agent—one of that strange breed as unknown to the reading public as they are well known to writers and publishers. He is tall, balding, with an aquiline nose and a quick and ready smile. The fact is that his sense of humour really dominates his sound business judgment. If it didn't he would never have headed for any oasis more distant than the Plaza bar, or Sardi's. The difference between him and Catherine is that Alan knows why we are going into the desert—for pleasure, curiosity and relaxation; mental if not physical. Catherine's reasons are more of a practical nature. She secretly hopes that we may find the fabulous lost oasis of Zurzura—that apocryphal paradise which is only revealed to desert travellers in the last stages of thirst and madness —or a new source of the Nile; or the valley of diamonds which Sinbad visited aboard his pet roc. Obviously Catherine is practical from the word go.

Despite Liv's plea that the expedition should have no purpose, Alan invited the Smithsonian to send a man along if they felt that it would be of interest. And so Dr. Henry Setzer, Associate Curator of African Mammals for the National Museum, joined our party. Hank had been in Libya six years earlier, making a collection of small mammals from

(Continued on Next Page)

the Fezzan and some coastal areas of Tripolitania and Cyrenaica. He had never been to the southern oases of Cyrenaica, and, as far as he knew, no American museums had any collection from the Tibesti. Of the five Americans on the trip Hank is perhaps the most American looking of us all. This is no doubt due to the fact that his hair is crew-cut and that he wears trousers instead of shorts. Though Hank wears glasses, he can with the naked eye identify an ant's tracks at fifty paces. He is the only one of us who has had any real desert experience.

As to ourselves, we had a dozen reasons for involving ourselves in this expedition. After four years in Libya, living on the edge of the desert, we have made only a few brief trips into its fringe. We are due to be re-posted, and before we go we are keen to see what this Sahara really is. City Libyans think we are mad. On their vacations they go to Paris. And then Liv has discovered that there are these Tibesti Mountains in the south of the Sarara. They cover an area as large as England, with mountains the size of the Alps. They must be very barren, for the entire population numbers less than a medium-sized American town. He thinks he would like to set up a kingdom down there if nobody objects, and he has told Alan that he can be Prime Minister; he feels he is in a strong position to do this with a ready-made army of British troops under his command. The Tibesti Mountains, together with the Hoggar and Tassili to the west and the Ennedi to the south-east, are thought by some archaeologists to be the birthplace of the Egyptian and Mediterranean civilizations. Certainly the people of the southern Sahara left a wealth of fine rock-paintings and carvings as evidence that they were a people gifted in the spiritual as well as in the material. Now so arid, theirs was then a land of great herds and great hunters, and in it thrived many animals now extinct or retreated these thousand years or so to more sustaining country. And here lived men who could paint and carve and who had the eye and the heart to do so. The Tebu who live in the Tibesti today may not be descendants of these artists, but in their way they are as completely the product of the Tibesti as were the rock artists of six thousand years ago. We have a theory that in these people we may see a reflection cast on time of our own descendants of six thousand years from now.

Liv also wants to see just how bad the track is from the Mediterranean to the interior of Africa, as he believes that one day the central plains of the continent can be connected, through the desert, by a great north-south highway. This would bring back to life the caravan routes which once carried the wealth of Africa to Europe.

Liv is tall, thin and wiry. I think that St. Francis might have looked like him and even been like him, but Liv doesn't fancy being likened to a saint. Nor is he. He is both quick and impatient and quite horribly absent-minded. He often forgets to come home for dinner, and nearly always forgets things like cocktail parties. On the other hand he has an amazing tolerance for children and animals and is kind and forbearing just when I wish he wouldn't be. Like many tall men, he has married a little wife. I can remember as a child in England being teased at school and told that I would grow up a midget. Those horrid girls were wrong; I am all of five feet two. Catherine says that it is very bad for the ego of a tall woman to travel with a small one. She says that our twelve men are always quick to tote and carry for me or string up my laundry line, but that they all think she is a fine strapping figure of a woman and can take care of herself. The truth of the matter is that no one seems anxious to tote for anyone in this group. If anything we are travelling with men who might adopt as their own the saying of Randolph's little daughter, 'Papa likes to see women work.'

That is us, all fourteen. We have six cars, three of which belong to the Army and three are privately owned. They are all Land Rovers. We will drive south from Agedabia on the Libyan coast, crossing the eastern side of the Libyan Sahara to Kufra. From Kufra we will bear still further east to Uweinat, almost on the border of the Sudan. From Uweinat we will bear south-west and enter the Republic of Chad at Tekro, or thereabouts. From Kufra on, all available maps are vague.

Alonzo Pond and Paul Nesbitt, authors of a small and superb work on desert survival, tell of a group of men dropped in the desert and observed from the air. As they made their way from A to B, they were sometimes as much as two hundred miles off the trail, though they were following a map and the trail could be clearly seen from the air.

From Tekro, a desert outpost, we will make our way to Faya-Largeau, Zouar, Bardai, exploring the Tibesti and then through the Kourizo Pass northward into Libya again, to Sebha and back to Agedabia. These are our plans. We are on our way and Randolph is sitting in the middle of the highway passing the time of day.

We join him in a toast to the success of our expedition, gather Winston and the two Dutch oil men whom Randolph has invited for dinner, and find a camp-site in a eucalyptus grove near Agedabia.

Randolph claims the right to cook the first dinner. As we have brought along a cold roast of beef, potato salad, tomatoes, bread-and-butter and a Bel Paese cheese, we think it will not be too strenuous for him, and having laid out our provender Catherine and I drape ourselves about the grove and wait. Randolph calls first for his table, his two chairs and some light refreshment. Then he sits down and orders Winston to open the pate de foie gras and to put on the lobster bisque from Fortnum and Mason. The pate is delicious, but when we try to find a Dutchman to feed they have both disappeared. Randolph has objected to their hovering helpfully about the women, who were only too obviously delighted with their good looks and charming manners. 'Leave the women alone,' he'd shouted. 'Bugger off'—and they had.

The moment came when 'the women' have to undrape themselves from the grove and rescue the bisque which Randolph shrieks is being ruined. It is a superb soup, but Randolph pouts that the 'white ladies' have ruined it and refuses to eat. I don't think he intended to eat anyway. However, he has endeared himself to me by presenting me with his hot-water bottle which has a velveteen cover decorated with his initials. 'For your poor little arm,' he says. I have forgiven him the banished Dutchmen.

We must never again allow camp to be so chaotic. We have had a hard time finding pots and pans and toothbrushes and pajamas. But finally the beds are set up, teeth brushed, and the last sleeping-bag is zippered up with a sound that screeches in the silence and sets Catherine giggling. Her air mattress has been over-inflated and bounces her off on to the ground, where she flounders helplessly in her cocoon until Alan and Hank come to the rescue. Being near a town we post a guard. Once in the night Randolph's voice challenges the guard with a booming 'Who goes there!' And in the dawn Alan's bronchial cough is answered from beyond the grove by a donkey's bray.

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Next Issue of Bridge

REAL & IMAGINARY (from page 6)

sions about hiring and promoting employees, a portrait artist in California who studies it to learn personality traits of her subjects, a car salesman who uses it in extending credit to car buyers, and a Mother Superior who believes that it can be used to detect the possible development of unfavorable traits in children and can also help spot aptitudes and talent potential. Mother M. Cecilia Koehler, since her retirement as Superior of the Ursuline Academy in Paola, Kansas, has devoted her spare time to teaching classes in the basic principles of Graphoanalysis, and lecturing to civic and parent-teacher groups on the subject.

Personal and marriage counselors also find that they can often save hours of "talking time" by studying the handwriting of the people who come to them for help. And at least one minister-counselor suggests that engaged couples have their handwriting studied before they marry. Reverend W. Stanley Pratt says, "Graphoanalysis can pinpoint personality differences which might be insurmountable obstacles to a happy married life."

While Graphoanalysis has proved helpful in all these cases, according to V. Peter Ferrara, president of the International Graphoanalysis Society, the shining hours of handwriting analysts usually take place in the courtrooms when signatures and other writings must be authenticated.

A major incidence of another kind took place when Sheriff H. E. Parker of Bannock County, Idaho, isolated a murder suspect with the help of Graphoanalysis. After five handwriting analysts studied the writing styles of the suspects, they agreed independently that one man should be considered the prime suspect. The sheriff then concentrated his questioning on that person. He also began questioning the man's associates, and one acquaintance gave some facts that later led to a first-degree murder indictment.

However, personality as revealed through Graphoanalysis isn't cut and dried. Handwriting analysts recognize the fact that a person's handwriting can change as his personality changes, so they distinguish between primary traits and those that have developed as defense mechanisms.

People who use handwriting analysis principally for entertainment are frowned upon by Graphoanalysts. And anyone who uses it in connection with occult practices is denied membership in the International Graphoanalysis Society.

But in spite of the strides being made, Certified and Master Graphoanalysts find they must

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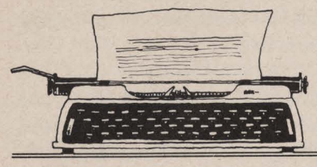
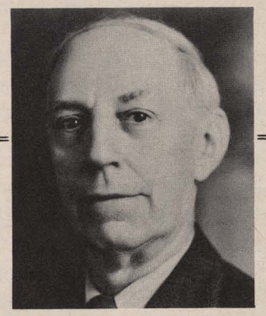


LETTERS from Ellery



THE PORTABLE SAWMILL

"I no believe, I no believe."

The boy hears these words shouted as one morning he hurries with his father to the portable sawmill which was set in operation a few weeks earlier on the top of the hill back of the barn. The boy recognizes the voice of the man from Quebec who tends the engine that drives the circular saw of that mill.

Coming in sight of the mill the boy sees that man surrounded by about a dozen others as the man throws on the ground the witch-hazel branch he has been holding in his hands. Shouts and laughter come from the group as the man walks away toward the engine.

One of the group calls out "The witch stick you held turned down when you were over the spot where it turned down when I held it. It proves for you, as it proved for me, that water is down in the ground there."

The engine-man cuts more wood slabs and throws them in the boiler furnace. With a disgusted expression on his face he again repeats "I no believe."

During the winter of 1887 the boy's father served as representative in the legislature in Hartford. On week-ends at home the men of the neighborhood whom he engaged to work as lumbermen reported to him on the progress made in cutting lumber to be sawed the following spring. One day the boy went with his father and the owner of the mill as they determined the best place for location of the mill. They decided it should be near the center of the woodland close to a small pool that would provide the necessary water for the boiler.

All his life the boy enjoyed visits to the many mills near his farm home to saw shingles, boards, planks and timbers as well as to grind grain. The motive power for these mills were water wheels. The older wheels were built of wood but the more modern ones were made from iron.

The more ancient mills for sawing were of the type called the "Up and Down." The saw for such a mill was of steel, long and straight. The large saw was held in a wooden frame in the vertical position. The frame was moved up and down by means of a wooden rod with one end connected to a crank on the horizontal shaft of the water wheel.

The log being sawed was mounted on a movable carriage which was advanced a short distance after the downward stroke of the saw, by a hinged ratchet connected with the mechanism. When the log had completely passed the saw the man operating the saw opened a gate which let a stream of water strike the wooden vanes of a second water wheel that was called the "Flutter Wheel." This wheel turned a metal gear which quickly brought the carriage back so the log might be adjusted for the next cut.

The action of the old type of saw was much slower than that of the newer circular type. The boy had heard his father tell how it was his habit, when operating the old form of mill, to start the mill and then go to the house for breakfast with expectation that when he returned to the mill the cut would have been completed.

A disadvantage of the circular saw was that with it the oaken planks for making drags could not be sawed. But by use of the old type of saw the thick, broad planks with upturned front like the front of the sled, could easily be sawed. Hence those wanting drags to haul stones or other heavy objects must take logs to the ancient form of mill.

In the early days of rural New England it was highly important to have a mill near every farm to saw materials for erection or repair of buildings and to grind grain for food for humans and animals. After he became an adult the boy was interested to learn that the first man of his family to live in the new town of Woodstock was induced to leave Boston in 1687 and, in the Indian country, to build and operate the mill which was so essential for the setting up of that new town.

The inducement was the gift of land near a stream of water which made available the power to run the mill. But the boy was greatly bored to hear talk about his ancestors. And he found no interest at all in the story that a century after Woodstock had been established surveys were made and it was found that Woodstock actually was in Connecticut and not in Massachusetts. The troubles that error brought did not interest the boy at all.

But the boy did have the keenest interest in the portable sawmill which in 1887 had been developed. It had the advantage of doing the sawing near the place where the lumber grew. It avoided the hauling of waste parts such as sawdust and slabs. Only the finished products needed distant transportation. But its chief attraction to him was that it gave him the opportunity to watch the operation of the new source of power, the steam engine.

During the winter months of that year groups of men who lived in the neighborhood worked with crosscut saws and axes to prepare the logs for sawing. The most valuable came from trees of oak and pine which yielded logs two or more feet in diameter and twenty or more feet in length, free of branches. Such logs were sawed into square edged boards or planks. Pine and hemlock trees not yielding logs free of knots were sawed into boards used to make boxes. Such boards had bark remaining on the edges and sold at a lower price. Tall slender hardwood trees were cut for telegraph poles. They were cut in lengths as long as possible and were stripped of bark but not sawed.

Hardwood trees too small for telegraph poles were trimmed of branches, cut in lengths of about 20 feet and taken to the farm woodshed and there formed into strips to be used as hoops for casks to hold molasses and other liquid products of the West Indies. Chestnut trees too large or not straight enough for telegraph poles were cut in proper length to serve as railroad ties and sawed on two sides with the correct thickness. Another product the lumber workers watched for were knees to be sold to builders of wooden sailing vessels. The knee

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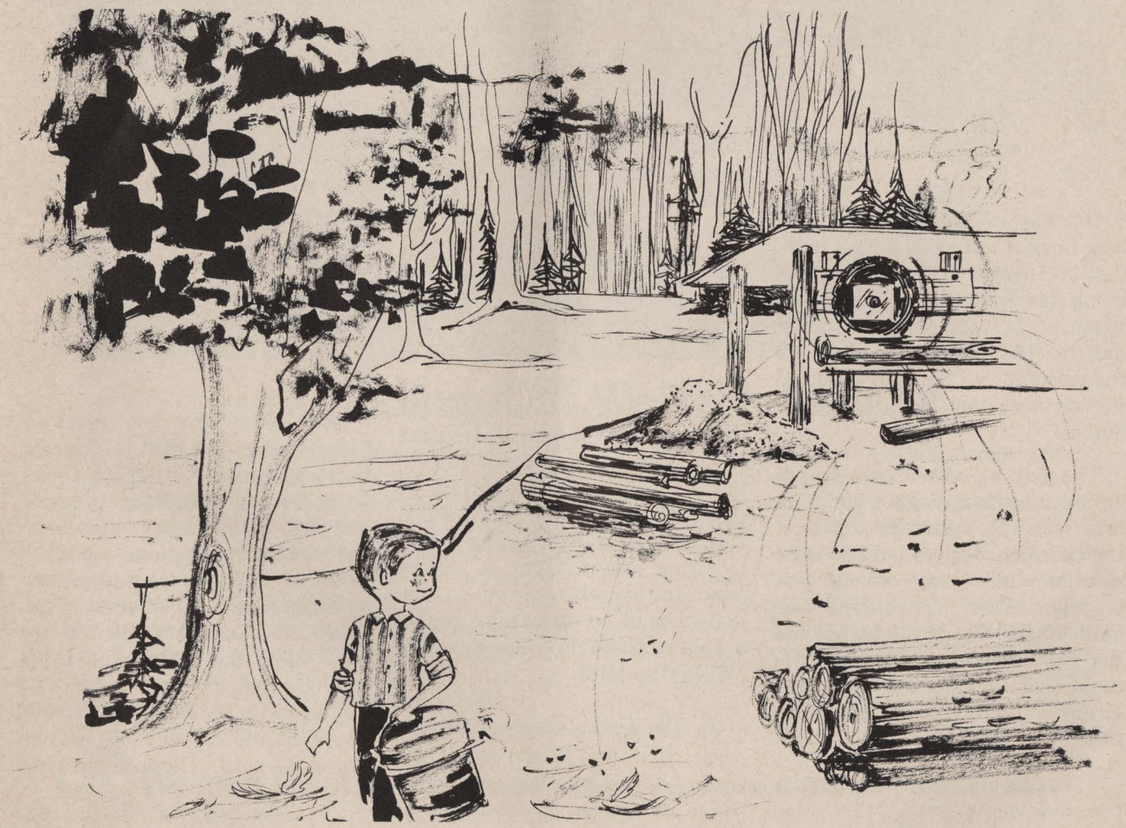


was the part of an oak tree where a branch grew from the trunk at an angle which made it possible to shape a piece to form a strong support where certain ship timbers joined. Branches of trees and trees too small for lumber were cut into four-foot lengths to be used for fuel.

The lumbermen were paid at a daily rate. A good worker was supposed to be worth one dollar a day. When cutting firewood the worker was paid one dollar per cord. Such wood was piled in stacks eight feet long and four feet high. In school the boy had learned that amount of wood formed a cord. The chief market for such wood was a nearby brick yard.

During the winter the hired man, using a yoke of oxen and a long iron chain, snaked the logs from where the lumbermen left them to a great pile near the site of the sawmill. With snow on the ground the logs could be dragged with no need of loading them on a sled.

One day in March the boy saw long lines of oxen and horses hauling the heavy parts of the mill along the highway and into the pasture. It was too late in the day for the parts to be taken to the woodland so the men detached the animals and left for their homes.

The boy at once began to examine the steam engine which to him was the most attractive of the machine devices, which were mounted on large wheels for transportation. The engine was built on the top of the boiler and the boy climbed up on it. He could not understand how the steam could make the shaft rotate.

The first boards sawed after the mill was erected, were used to build the shelter for the mill and the shanty in which the four men who operated the mill might eat and sleep. Around the mill a chief topic of conversation was the daily output of the mill. The interest in output became great as the output per day began to approach ten thousand board feet.

As the sawing progressed a period of drought set in. The dead leaves and small tree branches on the ground became so dry that the burning cinders ejected from the boiler stack began to kindle fires. So when the eight-week spring term of school ended the boy was given the task of watching for such fires and extinguish them with water which he carried in a pail. This was welcome work for it gave him the chance to remain near the mill he so liked to watch operate.

The period of drought brought another serious problem. Due to the dryness the pool of water diminished in size. There was danger of its failure to yield the necessary water for the boiler. This was the reason the man with witch stick came to the mill the morning the boy heard the cry "I no believe." The man was sure he could, with his stick, show the exact spot where water might be obtained by digging in the ground. The responsibility of what action to take rested on the boy's father, who did not join in the discussion, that morning, of the reliability of the witch stick. His father decided it was better to bring water from a nearby pond in barrels carried in the two-wheeled ox cart than to dig a hole in the stony place pointed out by the stick.

So the hired man with oxen named Tim and Curley, went for water. The oxen Dan and David which once were so attractive to the boy, were no longer living. They had been sold for beef. That was proof that his father was correct in his idea that oxen were better for farm work than were horses. The ox had value as food when he could no longer pull, but the horse had no value when it could no longer work.

Before that morning the boy had never heard of the use of the witch stick to find where water was in the earth. Later he cut a forked hazel branch and by himself watched its action as he held it in his hands and walked about. But he was puzzled for it did not always go down at the same place. Later in school he studied about many forces in nature but he never found reference in books to a force which water in the earth exerted on a hazel rod. He learned that divining rods had been discussed by church authorities and others for many centuries. And after he became a great-grandfather in 1964 the topic again came to his attention as he read of a college professor who offered a cash award to determine the veracity or falsity of the method. After long deliberation the offer was turned down by the American Society of Dowsers on the ground that "The Society has nothing to gain but everything to lose."

Soon after the boy and his father joined the men at the mill that morning in 1887 the man from Quebec, who had expressed disbelief in the witch stick with the words "I no believe," motions to the sawyer that the boiler pressure has risen to the point of running. The sawyer calls to the boy "Blow the whistle," a thing the boy greatly likes to do. So he jumps on the belt that extends from engine to saw so he can reach the cord. He pulls the cord

(Continued on Page 24)

CHAPTER ACTIVITIES

IOTA, University of Missouri—Iota Chapter of the University of Missouri, early last fall, assisted in tours and guidance sessions during the annual High School Day held on the Columbia campus for the various high school juniors and seniors in the state. HKN members were proud to show our expanding electrical engineering facilities to the prospective collegians. Slide Rule classes were held by the Iota Chapter for incoming engineering freshmen, as well as those "old timers" who haven't yet got the hang of the "slip stick."

A pledge class of eight men was selected early in the semester and a few weeks before Christmas, they were initiated as full members. Now that the New Year has come, and with it, a new semester, we are all planning and looking forward to the annual Engineers' Week celebrations that take place in March.

PI, Oregon State University — During the 1965-1966 year, Pi Chapter has continued toward its goal of service to the Electrical Engineering Department and the University. In November, the pledges published a student-faculty directory of the department and distributed to all the electrical engineering students. These pledges were introduced to the members at a coffee hour the week before fall quarter final exams. At the banquet following the initiation winter quarter, Rev. John Conner spoke on "Engineering Ethics." His remarks about the ethics of an individual in relation to himself and others were accented by humerous examples and were well accepted.

The chapter conducted an open house of the Electrical Engineering Department on Dad's Weekend February 19th. The members presented typical experiments in all the labs and served as guides. Several of the members also served as guides for Beaver Open House earlier in the term.

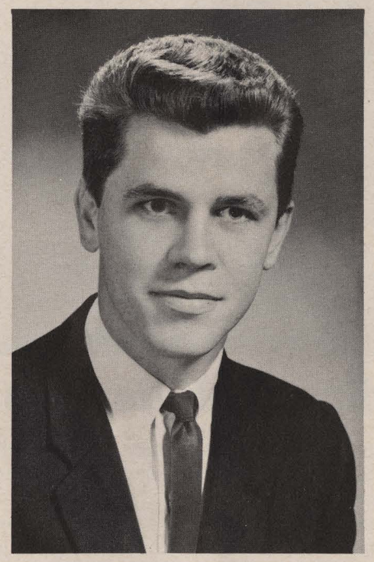
SIGMA, Carnegie Institute of Technology — Sigma Chapter has kept fairly active during the past semester. In December the chapter initiated 14 undergraduates and two graduate students. A sophomore lab project was begun with good success. This involved publishing of solutions to lab problems after they had been worked out by a committee of upperclassmen.

The Eta Kappa Nu course evaluation committee, a project begun two years ago, is being continued. This committee provides an informal forum where students and faculty can discuss electrical engineering curriculum, its successes and problems.

This year a library of graduate school catalogues and other information along these lines was started by the Chapter. Over 100 schools were contacted in this effort.

ROBERT S. WAGERS NAMED RHODES SCHOLAR

Robert S. Wagers, electrical engineering student at Arizona State University, has been named recipient of a coveted Rhodes Scholarship to Oxford University, England. Wagers, President of the Epsilon Beta Chapter of Eta Kappa Nu, was one of the nations 32 top scholars selected for this honor.



The Rhodes Scholarships were instituted by Cecil John Rhodes, a British statesman and philanthropist, in 1902. Each scholarship carries a stipend of 900 pounds (about $2500) per year for the two years of study at Oxford.

At Oxford, Wagers will study physics in one of the school's 25 colleges. The curriculum at Oxford consists of three eight-week terms of school a year. During this time, Wagers will not attend regular classes but will be assigned a tutor who will prepare him for the 30 hours of final examinations at the end of the two year period. Between these periods of study, Wagers plans to tour extensively in Europe.

OMEGA, Oklahoma State University — The following is an activities report of the fall semester of 1965 of Omega chapter.

The active membership consisted of 36 active members. There were 13 new undergraduate members inducted. A new Engineering building was recently built at O.S.U. and one of the display cases in this building was assigned to the Electrical Engineering department. It was Eta Kappa Nu's job to fill this display case with articles relating to the field of Electrical Engineering.

Omega chapter of Eta Kappa Nu is sponsoring an Engineering club at Cameron Jr. College, Lawton, Oklahoma. A visit was made to Lawton this semester to promote interest in Engineering and O.S.U.

At the end of the semester, a field trip was made to Boeing Aircraft Company in Wichita, Kansas. This field trip was opened to all Jr. and Sr. students of Electrical Engineering at O.S.U.

BETA BETA, Polytechnic Institute of Brooklyn—This past semester Beta Beta Chapter continued its departmental tutoring program while expanding its services to facilitate the securing of technical summer positions for lowerclassmen.

The brothers also undertook the publication of a bi-weekly newsletter, "Feedback," with departmental news, biographies of instructors, articles on the latest research being conducted at Poly, engineering problems, etc.

On December 10, 1965, Beta Beta held its initiation and awards banquet, at which time twenty new members wre inducted. Guest speaker that night was renowned science fiction writer Frederick Pohl.

In addition, Beta Beta voted recognition for several new HKN chapters and also approved the admission of a professional member to our chapter.

BETA GAMMA, Michigan Technological University—The Beta Gamma Chapter at Michigan Technological University offered their annual "Slide-Rule" course to the 1400 incoming freshmen students at 50c a person. This course lasted for three, three-hour sessions and enlightened many freshmen about the use of a slide rule. It also helped the chapter's treasury. Our fellow brother Dan Shultz is trying to get enough seniors to stay at Tech for graduate work and start a graduate course in computers.

BETA RHO, West Virginia University—The Beta Rho Chapter initiated seven new members during the first semester of the 1965-66 school year. The initiates were required as part of their pledge duties to reorganize the Electrical Engineering Department reading room and to repair the shadow box used in HKN initiation ceremonies.

The Chapter revived its tradition of honoring the sophomore Electrical Engineering student who achieved the highest average during his freshman year at W.V.U. As a part of their initiation ,this semester's pledges were required to re-engrave the plaque once used to display the names of the award winners. The plaque will now be brought up-to-date and a member of the present freshman class will be chosen to receive the award.

The members and initiates of Beta Rho Chapter, as well as those of several other engineering honoraries, in conjunction with Tau Beta Pi held the Annual Honoraries Banquet. During the affair, one of the HKN initiates, Jay Pultz, was awarded the first prize in the Tau Beta Pi Pledge Essay Contest.

GAMMA THETA, University of Missouri—Gamma Theta Chapter at the University of Missouri at Rolla received 35 undergraduates at its annual fall initiation ceremonies on December 4, 1965. Professor John M. Brewer, Humanities professor, was guest speaker.

The Chapter has as its co-advisors Dr. E. C. Bertnolli and Professor George McPherson, Jr.

A very successful project has been the providing of laboratory insurance to EE students at a nominal fee. Funds received provide an annual scholarship to an outstanding EE senior. Other projects include: calibration of meters in Electrical Power Laboratories, Department Directory Showcase, mimeographed 8 x 11 tube and transistor characteristic curves for faculty and student use.

At the annual Engineer's Day and Parent's Day, members conducted guided tours of the building and laboratories and provided various electrical demonstrations.

DELTA BETA, Lamar State College of Technology—The Delta Beta Chapter initiated four new members on October 29, 1965, and honored them with a banquet following the initiation ritual. Mr. Peter Wells, a local attorney, was guest speaker at the banquet. He spoke on some relatively unknown but interesting facts about Texas history.

Other activities of this semester included initial preparations for a newsletter to all members of the Delta Beta Chapter.

DELTA ETA, University of Massachusetts—On November 13, 1965, Delta Eta Chapter initiated 12 new members into Eta Kappa Nu. After the initiation ceremony, the fall banquet was held at the Wayside Inn in Chicopee Massachusetts. The banquet was attended by all the Delta Eta members and their dates.

This semester the Delta Eta chapter sponsored a Student Faculty Night. A short skit depicting various faculty members was presented by the senior Electrical Engineers. A coffee hour followed the skit. The Delta Eta chapter also aided in presenting a series of four lectures open to all senior engineers. Topics discussed varied from graduate school requirements to the purchasing of life insurance.

DELTA NU, University of Alabama —This semester the Delta Nu Chapter initiated fifteen new members. These members included six undergraduate students, eight graduate students, and Dr. William E. Webb, a member of the electrical engineering faculty.

The pledges were required to polish their own brass emblems and to wear them the week before the initiation ceremony. They were also required to obtain the signatures of all active, faculty, and graduate members still on campus, and to learn parts of the Constitution and By Laws.

The formal initiation ceremony took place on December 12, 1965. After the ceremony, officers for the spring semester were elected. The president for the spring semester is Cary Williamson.

After the election, all members gathered at the home of Professor Willard F. Gray, head of the department of Electrical Engineering, for a buffet dinner, which was excellently prepared by Mrs. Gray. Preceding the dinner, the new undergraduate members were given some components for building an electric light sensing device, and the graduate students were given some components for building an electric heat sensing device. The undergraduates succeeded, but the graduate students ran into some difficulty that was never solved. Jokingly one of the graduate student professors present suggested that the undergraduate and graduate students should exchange classes.

THE OLD PROFESSOR SAYS: Whether or not life is worth living depends on the liver.

This semester the chapter continued its permanent membership roster and sponsorship of the hanging of the pictures of the graduating electrical engineering students in the hall. Also the chapter completed the arrangements for co-sponsoring a display case in the lobby of the electrical engineering building. These projects should help to stimulate interest in scholarship and in the Eta Kappa Nu Association.

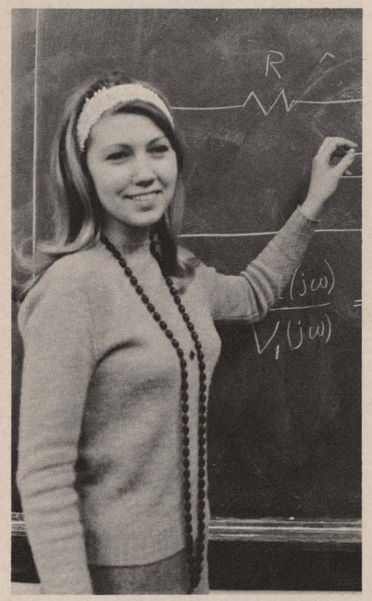
DELTA XI, Air Force Institute of Technology—The Delta Xi Chapter of HKN at the Air Force Institute of Technology held an initiation of new members August 5, 1965. Ten members were initiated, six undergraduate students and four graduate students. A dinner was held that evening. The guest speaker was Harold C. Larsen, Professor and Head of the Department of Aeronautical Engineering at AFIT.

DELTA SIGMA, Notre Dame —
During the period a "get-together" party was held for the pledgers, brothers and faculty members of the Electrical Engineering Department. The initiation period culminated in the initiation ceremonies and banquet held on December 12. The guest speaker was Dr. Kenneth Sayre, from the Department of Philosophy, who spoke on the future of man in society and space and the moral problems and decisions he would face. His speech was well received and it gave each brother a better knowledge of the new thoughts in the College of Arts and Letters as well as a more liberalized outlook. An additional attraction at the banquet was the reading of the best pledgers' papers. One was by Michael Grohman on the scientist versus the engineer in society; another by Al Metrailer on friendship; and a third one by Bill Leonard on his future plans, written in the Greek language and in a poetic style.

The I.E.E.E. and H.K.N. cooperated to present for the juniors and seniors in the Department of Electrical Engineering a Seminar on Graduate Studies. Professors from the Colleges of Commerce and Engineering and the School of Law were invited. They presented an extensive list of possibilites for graduate school as well as the difficulties of graduate studies and the requirements for graduate work. After the seminar, the audience and the panelists joined in smaller groups to continue the discussions in an informal atmosphere.

DELTA OMEGA, University of Hawaii—Following are some of the activities of Delta Omega chapter: Orientation for freshman engineering students. Participation in orientation along with other student organizations. President of Chapter spoke to students about HKN. Luncheon given for prospective candidates for pledging at East-West Center. Pledge projects: made brass plaques of the HKN Symbol; interviewed by chapter advisor; presented demonstrations at local high schools.

Delta Mu's First Coed Member is VERONICA WYRWAS



Miss Veronica J. Wyrwas was the first woman ever to be initiated into the Delta Mu Chapter of Eta Kappa Nu. She is the only female member of the Junior Class at Villanova University's nearly all male Electrical Engineering School and is a student member of the IEEE.

Veronica said, "When my guidance couselor told me during my Junior year in high school that test results pointed toward my becoming an engineer, I thought it was a joke. I had never given it a thought, but I find it fascinating. It has enabled me to see things from a different viewpoint."

She apparently is seeing things pretty well, since she's been on the Dean's list as long as she has been at Villanova and received special recognition for her volunteer tutoring efforts.

She has a wide range of interests in both the technical and non-technical fields as indicated by her minor course being French, and her ability to play the piano and violin.

Being a girl in a man's world has its moments. Not long ago, Veronica and some of her classmates went on a skiing trip. When the group arrived at the ski lodge, the nonplused Manager didn't want to let them in at first. It seems he expected all males.

So how does she like being the only girl in the classroom? "Boys are great," she answers.

IF YOU WERE COMING IN THE FALL

If you were coming in the fall,
I'd brush the summer by
With half a smile and half a spurn,
As housewives do a fly.

If I could see you in a year,
I'd wind the months in balls,
And put them each in separate drawers,
Until their time befalls.

If only centuries delayed,
I'd count them on my hand,
Subtracting till my fingers dropped
Into Van Diemen's land.

If certain, when this life was out,
That yours and mine should be,
I'd toss it yonder like a rind,
And taste eternity.

—Emily Dickinson

REAL & IMAGINARY (from page 17)

fight to disperse the cloud of doubt and skepticism created by carnival-type operators.

(Next Column, please)

"Slowly and surely we are winning this battle," says the head of the Society. "And Graphoanalysis is taking its rightful place as a method of personality assessment to be used along with, or in some cases, even in lieu of, other psychological testing devices."

It's not whether you dot your i's and cross your t's that counts, apparently, but *how*. And from now on, minding your p's and q's may be more important than ever before!

ELLERY (from page 20)

and the whistle emits the long loud warning that the mill will again begin to operate, and jumps to safety from the belt. The man from Quebec opens the throttle valve and the engine begins to turn. The tail sawyer begins to roll a log on the carriage by use of his cant hook. The marker takes his position back of the saw. He holds a large black crayon in the fingers of the hand holding the marker rod and with the other hand removes the wooden pegs from the holes in the vertical board on which the board feet sawed yesterday is recorded. The man whose job is to take the sawed parts away to the proper stacks for piling drives up his team. The boy with pail of water goes to watch for fires. Great clouds of smoke and steam rise from the stack accompanied by the sound of engine puffs. As the rate of puffs increases the sound from the rotating saw rises until at full speed it emits a high-pitched singing sound.

Another day of sawing has begun. Will a new record of board feet output be made. Only time can tell.

Love to all,

ELLERY

Official HKN Price List*

OFFICIAL MEMBER EMBLEMS:	10K Yellow Gold	14K White Gold
Plain (Unjeweled) Key	$ 5.50	$ 7.50
Plain (Unjeweled) Pin	5.50	7.50
SISTER OR SWEETHEART PINS:		
Crown Set Pearls	16.50	19.50
Plain (Unjeweled)	5.50	7.50

PLEDGE BUTTONS: $12.00 per dozen

Guard Pins	Single Letter	Double Letter
Plain, 10K Yellow Gold	$ 2.75	$ 4.25
Plain, 14K White Gold	3.75	5.25
Crown Set Pearl, 10K Yellow Gold	7.75	14.00
Crown Set Pearl, 14K White Gold	9.75	16.00

Tie Clasps
(Illustrations Actual Size)

Bar Type, Yellow Gold-filled, mounted with 10K Yellow Gold Official Plain Pin	8.25
Sterling Silver, mounted with 14K White Gold Official Plain Pin	10.25
Chain Type, Yellow Gold-filled, with 10K Yellow Gold Official Key attached	7.50
Sterling Silver, with 14K White Gold Official Key attached	9.50

*To all prices listed must be added the Federal Excise Tax of 10%, and any State Sales or Use Tax, and City Tax where applicable. If in doubt order C.O.D. A deposit of at least 20% must accompany all C.O.D. orders.

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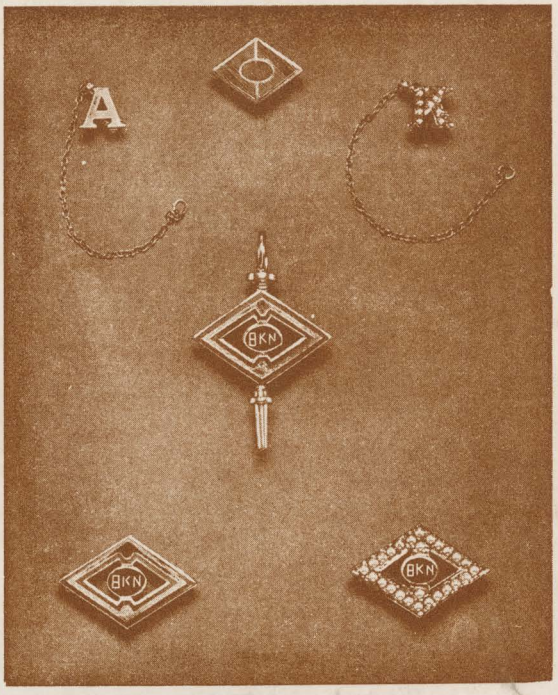

Top to bottom, left to right: Plain Guard, Pledge Button, Crown-Set Pearl Guard, Standard Plain Key; Standard Plain Pin, Crown-Set Pearl Pin.