

SPARTAN ENGINEER

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3 CREDITS



START

LAB-YRINTH

Page 17



NOVEMBER, 1967

25¢

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These graduates needed: Engineering, Physical Sciences, Social Sciences, Engineering Administration, Industrial Technology, Business & Liberal Arts.

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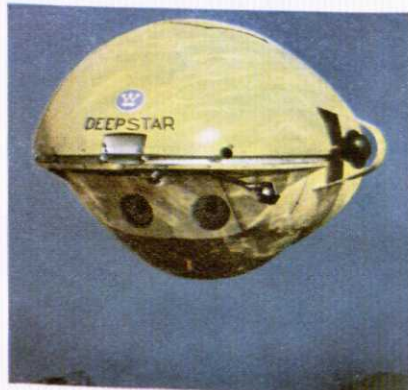
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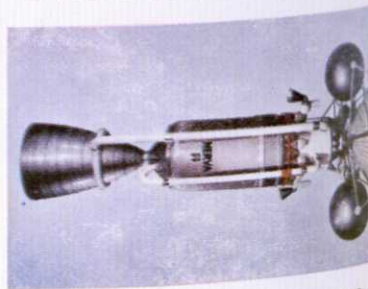


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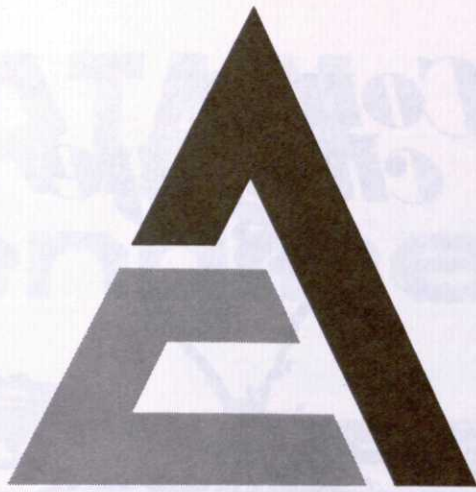
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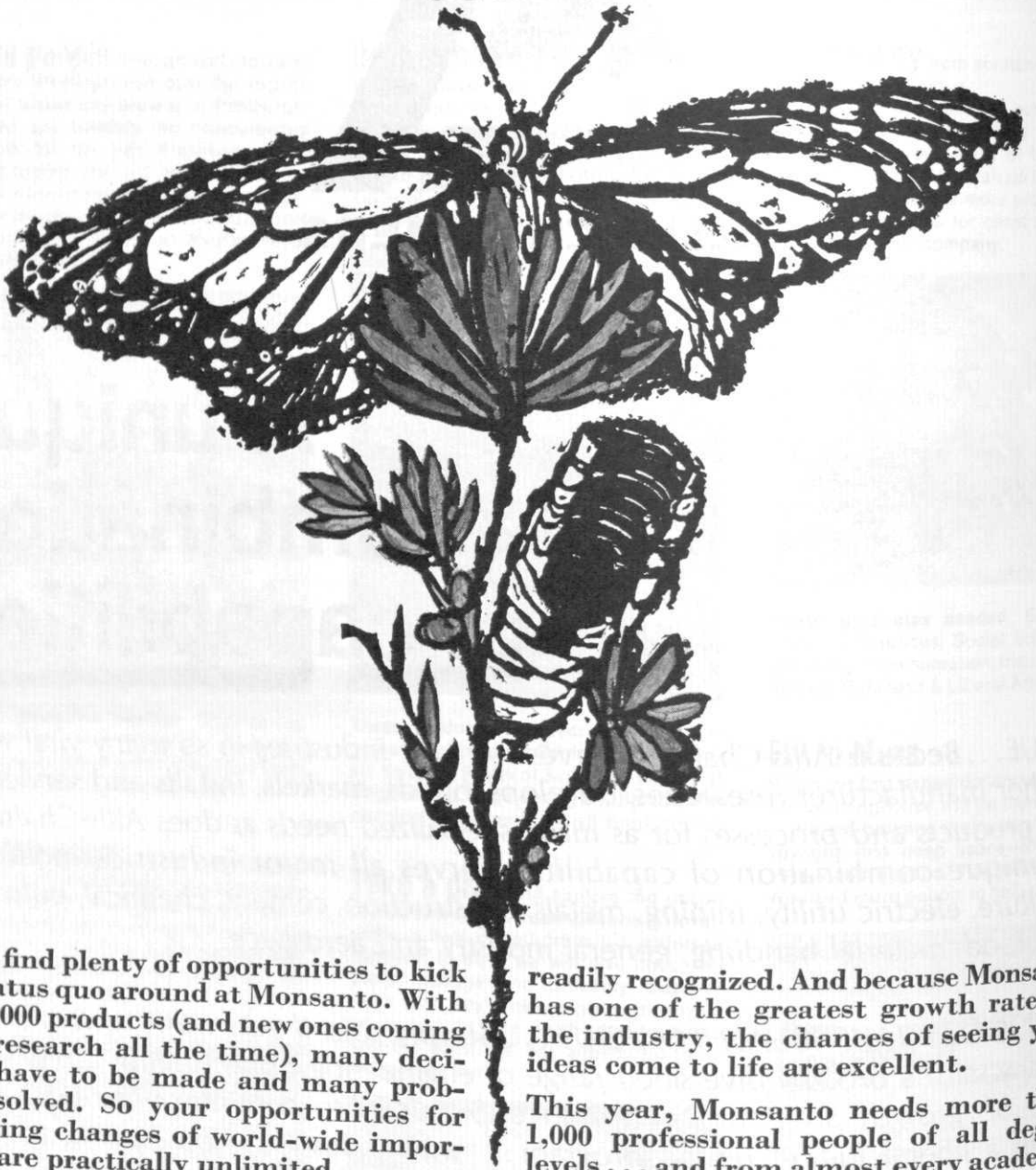
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SPARTAN engineer

VOLUME 21

NUMBER 1

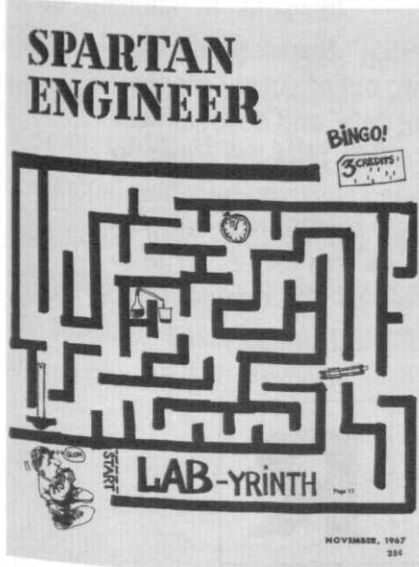
NOVEMBER, 1967

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This month's cover is done by Tom Price, and is his impression of what the engineering student faces in his lab classes.

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Member, Engineering College
Magazine Associated

Chairman: Howard K. Schwebke
University of Wisconsin, Madison, Wisconsin
Publisher's Rep.: Littell-Murray-Barnhill, Inc.
369 Lexington Ave., New York 17, N.Y.
737 N. Michigan Ave., Chicago, Ill.

Published four times yearly by the students of the COLLEGE OF ENGINEERING, MICHIGAN STATE UNIVERSITY, East Lansing, Michigan 48823. The office is on the first floor of the Engineering Bldg., Phone 517 355-3520. Subscription rate by mail \$1.00 per year. Single copies 25¢.

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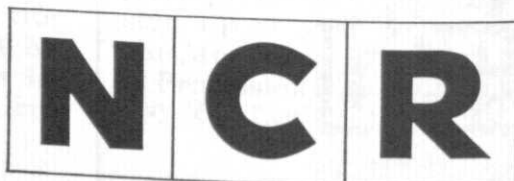
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In a list of "emerging ideas of 1966," Business Management magazine credits NCR with two out of seven: pioneering in laser technology for recording data, and development of our new PCMI microform system that puts the Bible on a projector slide.

When you start looking, look closely at NCR. NCR can surprise you; maybe you have some surprises for us. Write to T. F. Wade, Executive and Professional Placement, NCR, Dayton, Ohio 45409.



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What is there left for you to discover?

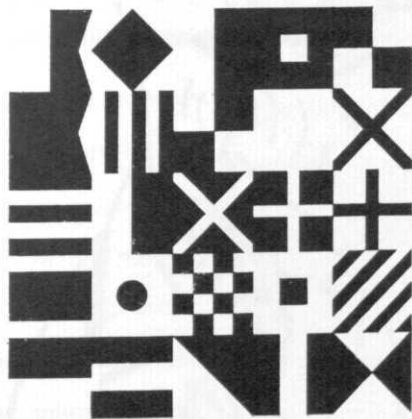
Cyrus the Great, King of Persia, built a communications system across his empire some six centuries before the Christian Era. On each of a series of towers he posted a strong-voiced man with a megaphone. By the 17th century, even a giant megaphone built for England's King Charles II could project a man's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

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

ways to communicate across international boundaries.

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

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SIX MUNCE UGO I, CUTNT
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- AN NOW I ARE ONE....

A NEW YEAR

It is November and the Spartan Engineer is embarking on its second year of being the only college engineering magazine in the country to be completely without technical articles. This is possible only because the interest shown in the magazine last year was greater than shown ever in the past. My staff and I hope that we can keep the magazine just as interesting in the coming year. As can be seen by this issue, we are not planning on changing our "Philosophy of Contents".

I would like at this point to thank the administrators of the College of Engineering for their support of the magazine and their permission to allow the magazine to contain articles of the type most students seem to want to read. I met with many other editors of college engineering magazines at the beginning of the term and often heard the comment that they were forced by their college to print technical articles that were of worth to only a few students. They then complained about lack of student interest in their magazine.

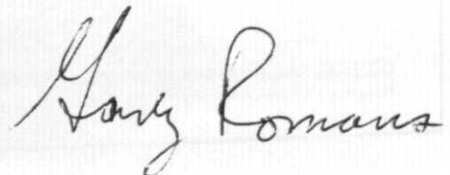
As for student interest — you may have noticed that, my being an Electrical Engineering student, last year the magazine was slightly orientated toward Electrical Engineering. We will try and remedy that in the future. The staff, as it stands now, consists of two Electrical Engineering majors, four Mechanical Engineering majors, and two Chemical Engineering majors. But eight people cannot run a magazine of this size. As is usual among college engineering magazines, we are in dire need of new staff members. Any-

one interested should give their name to Keith Asplin, 210 EB. Not only is it fun putting out the magazine, but being on the staff is a worthwhile thing to mention during a job interview.

I would like to finish with a few words on why the cartoon is facing this editorial. I was fortunate enough to obtain a technical job this summer with Western Electric Company (see How I Spent My Summer Vacation, page 27) It was shown me that there is something that is not emphasized enough in our engineering education. Namely that when we graduate we will not be engineers. True, we will have a diploma that says Engineering on it, but it won't mean much. I worked with men who had two or three years of college or military training in electronics, but had no degree. They do not have the earning power that I will have when I graduate, but most of them know more electronics than I ever will.

The piece of parchment I will get in June only means that I was able to show I could learn by making it through four years of an electrical engineering curriculum. A graduate may make it in industry or he may not, and it will take him a few years to find out. Only when he proves that he can correlate his training to the world outside the college can he call himself an engineer.

I highly recommend that, if at all possible, every attempt be made to obtain a technical summer job. It will provide you with a rude awakening.



SYMBOL DEPLETION

We've almost lost a good word, and we hate to see it go.

The movie industry may feel the same way about words such as colossal, gigantic, sensational and history-making. They're good words—good symbols. But they've been overused, and we tend to pay them little heed. Their effectiveness as symbols is being depleted.

One of our own problems is with the word "opportunity." It's suffering symbol depletion, too. It's passed over with scant notice in an advertisement. It's been used too much and too loosely.

This bothers us because we still like to talk about opportunity. A position at Collins holds great potential. Potential for involvement in designing and producing some of the most important communication systems in the world. Potential for progressive advancement in responsibility and income. Unsurpassed potential for pride-in-product.

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Join us and express yourself.

We'll give you all the paper you need. And a chance to put something on it. Of your very own. We'll even give you a place to put it. With plenty of room for the mistakes you're bound to make along the way. You'll have the time you need, too. To try. And try again. One more time. Then one more. Until you solve each problem to your own satisfaction. We're not afraid to let you wage the creative struggle for a successful idea. Within yourself. Or with us. We'll give you every chance to know that glorious satisfaction that comes when you find the answer to a challenging problem. And we'll reward you. With our very choicest paper. The green kind.

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Dean's Letter

A Note From Student Affairs

by **G. M. VanDusen**

This past summer Mr. C. I. Mensendick, formerly Assistant Dean for Student Affairs, assumed new responsibilities within the College of Engineering. It is deemed significant at this point to trace some important developments of the Student Affairs Office under his leadership.

In September of 1962 the College of Engineering took occupancy of its new building, making it possible to bring under one roof virtually all of the departments and agencies of the college. Paralleling this step forward, the functions of the Classification office and the Freshman office were combined under the Engineering Student Affairs Office. This new Student Affairs Office continued to serve as the coordinator for academic advisement, the centralized clearing house for admissions and academic actions taken by the College, and as the primary record-keeper for both undergraduate and graduate records.

This area was charged, however, with a new responsibility; to add a new dimension to our relationships with both undergraduate students and those high school students considering entering the engineering program at Michigan State. This function might be defined as the responsibility to provide leadership in developing a program which recognizes students as unique personalities requiring individualized attention to their various academic, social and personal needs. The program under the leadership of Mr. Mensendick has been under active development for the past six years, emphasizing improved articulation with high school students and developing closer, more personal relationships with undergraduate engineering students. The Student Affairs program has expanded both in terms of the number of staff members engaged in this work and in terms of the breadth of the activities which are being undertaken. This has been accomplished through the cooperative efforts of the various departments in the college and the office of Student Affairs.

It has been my privilege to work in this program with Mr. Mensendick for the past four years. His contributions to the development of this program are indeed appreciated and his counsel and judgment will be valued in the future.

The less you've heard about us the better.

Maybe you think that's a funny way to talk to you.

But we don't think it is.

Many people think we're only a big chemical company.

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But what we'd really like you to know is that we're also a forest products company. Olinkraft.

Plus a lightweight paper company. Ecusta.

Plus a packaging film company.

And that we're an aluminum company. And a brass company.

And a sporting arms and ammunition company. (You've heard about Winchester? That's us.)

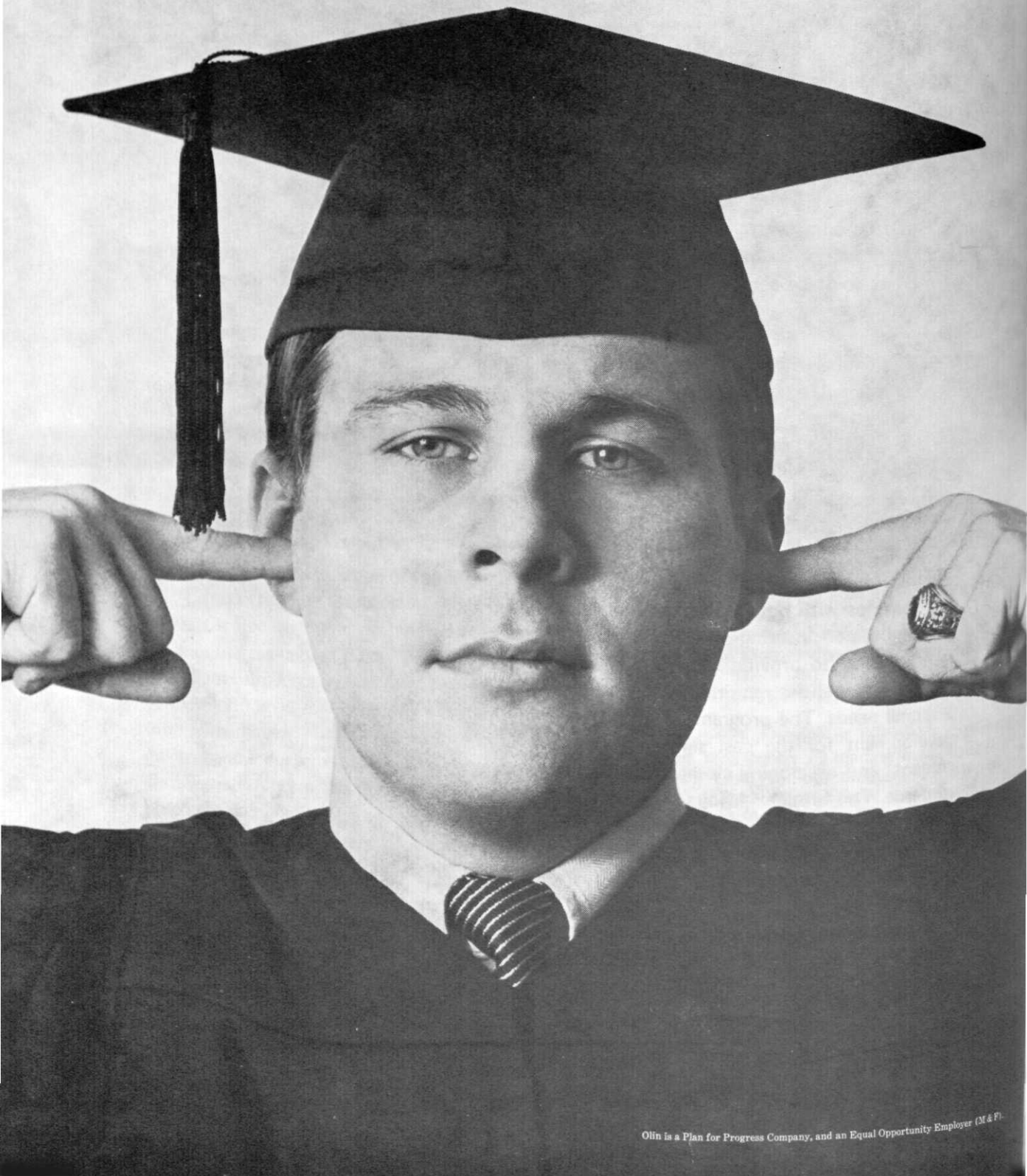
The reason we're telling you all this is that the competition to get you is awfully tough.

And a big corporation that can offer you the choice of a dozen smaller companies, has an edge.

But don't let this steer you away from chemicals, if that's on your mind. There's everything here from inorganics and organics to specialty and agricultural.

Now you've heard more about us. That's better.

You can do two things now. Meet with your Placement Officer. Or write Monte H. Jacoby, our College Relations Officer, here at Olin, 460 Park Ave., N. Y. 10022. **Olin**





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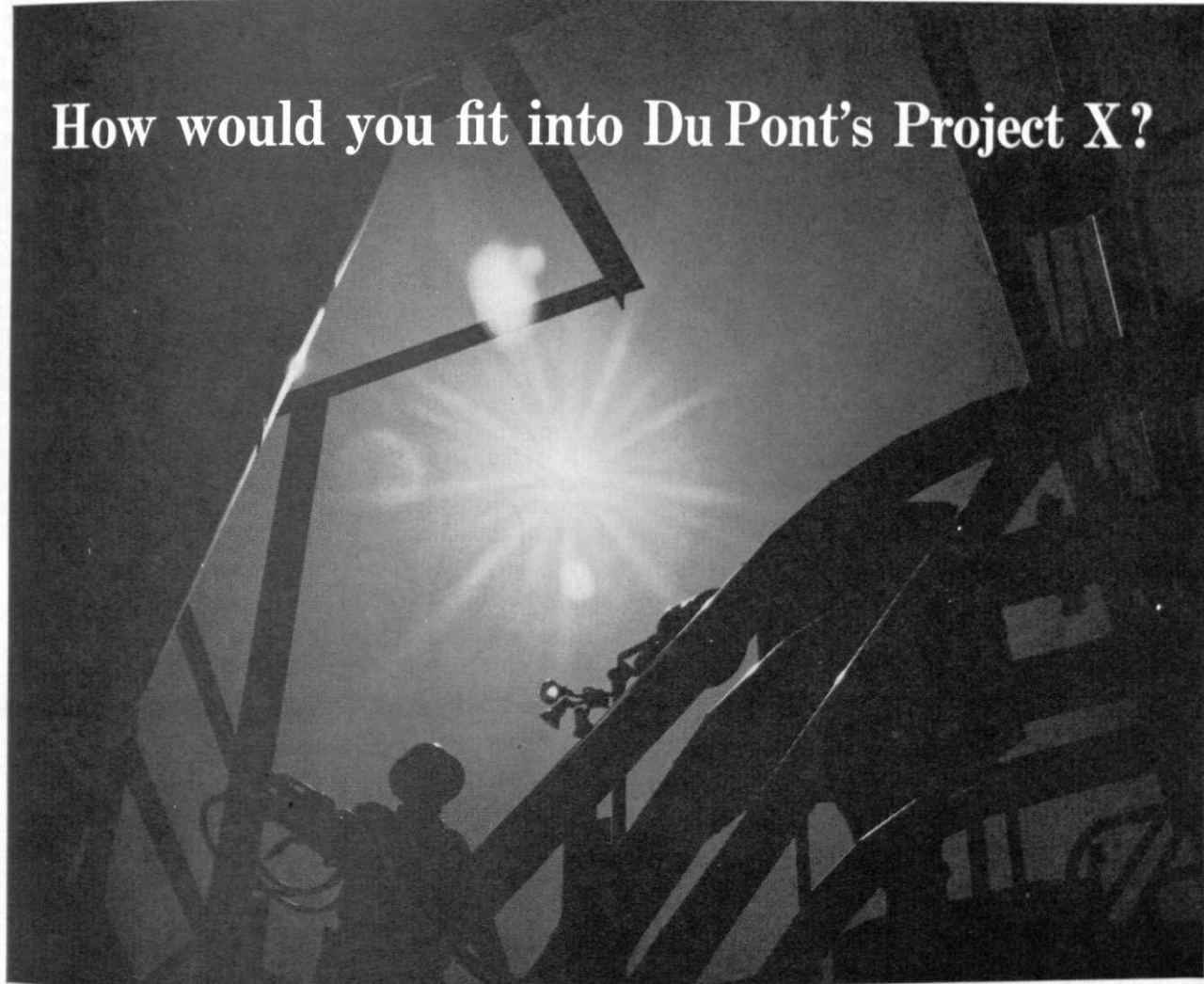
Opportunities exist not only in technical areas, but also in business and financial management.

You've spent years preparing for the "right" job . . . now take time to select the "right" company. For a copy of Raytheon's latest brochure, or to arrange an on-campus interview, contact your placement director or write: Manager of College Relations, Raytheon Company, Lexington, Mass. 02173.

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You work in small groups where individual contributions are quickly noted and appreciated.

The work is significant, and of benefit to society. You're part of the most exciting technical environment available today and tomorrow, and facilities and associates are the best.

How could you fit in? Why not sign up for a chat with a Du Pont interviewer and find out? The coupon will also bring you more information about us.

Finally, what is Project X? We don't know yet. Could be we're waiting for you to tell us.



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DAMN DAT DESKIMO POINT.

It has always been common around the Engineering Building to see junior and senior engineering students complaining to anyone who'd listen about their laboratories. In the past few weeks I have interviewed the chairmen of the various departments in the college to determine their justifications for some of the aspects of the labs which cause the complaining among the students. The following statements were written from notes taken during these interviews. These men all expressed concern for the students views, so in the next issue of this magazine will be printed interviews with students who either agree or disagree with what the department chairmen said.

DR. H. G. HEDGES
Electrical Engineering

The purpose of the electrical engineering labs is to relate mathematical models to physical systems, since engineers use

THE

applied mathematics in industry. Labs also give students knowledge of the kinds of measurements able to be made. These are representative of industrial measurements. The students learn to record and use measurements to their advantage. They also learn how to use the instruments required to make these measurements and the faults of some of these instruments. Use of data and the ability to relate variables is also stressed. Electrical Engineering labs are basically of two kinds -- cookbook and thought. The first few labs are basically of the cookbook type. As the student progresses the labs use more and more of the design type experiment.

About two hours are expected to be spent before the lab period on a preliminary report. A quiz is usually given at the beginning of the period. During the three hours of lab questions are answered. Two formal reports are required per term and the grade is based on these formal reports, the pre-reports, quizzes and lab performance.

Each term one instructor supervises all the sections and meets with all the other instructors

almost every week to keep as much uniformity as possible within the different sections of a particular course. The labs are open in the evening and extra lectures are being given in some courses to cut down on the preliminary work.

Dr. Hedges has sympathy for the students and is trying to improve on the quality of the labs. Due to advances in science and technology over the past few years there are more things to cover in the curriculum. In the labs things are done to prepare the students for the future. A problem will exist if the student spends too much time on labs and becomes lax on other subjects. The student should learn to budget his time.

DR. C. R. ST. CLAIR, JR.
Mechanical Engineering

The student receives one credit per three hour lab, whereas he receives one credit per one hour lecture. The reason for this is that lectures require more preparation. Labs require less concentration, time and effort. The amount of credits given for a

LAB

course depend on the material covered and the degree of difficulty. The labs demonstrate the principles presented in the lectures. Each lab is set up per the experiment. Some labs are of the cookbook type. Some are mere design in nature. Whereas some are demonstration and calculation types. Each individual lab should be judged in regards to quantity and quality. Dr. St. Clair feels that there is a good assignment of credits to the labs but it is not the ultimate. He also feels that there has been a fairly accurate evaluation of the labs, but is willing to look at them again.

The impression the student has when he takes a lab is that it is necessary, but not of first interest. This may be because of the emphasis placed on analysis and theory in the lectures. Maybe the student hasn't been trained for labs. Feeling that the student lacks

interest in labs, the ME department tries to give the students motivation. The students start with precepts and the labs bring them into contact with real things. The ME labs are not set up to simulate industry. No on the job training per se is given. The labs emphasize fundamental laws of engineering. The purpose of the labs is to train students in things fundamental in physical and engineering fields. Fundamentals are more important than specifics because they are used in all fields of industry. The reason labs stress fundamentals rather than job training is that industry is better able and equipped to do the latter.

DR. M. H. CHETRICK
Chemical Engineering

The Chem. E. Department has only one lab conducted by their own staff. The Chem. E. 422 lab is offered to seniors only. It is a four credit lab that meets twelve hours per week. There is not too much outside homework involved. The lab is designed to give students a taste of problems they might encounter in industry. Each group of students is given a vague assignment. They have to determine what the problem is, how long it will take to be completed, and their plan of attack. There is a member of each group appointed foreman. The foreman supervises the proceedings and the job ro-

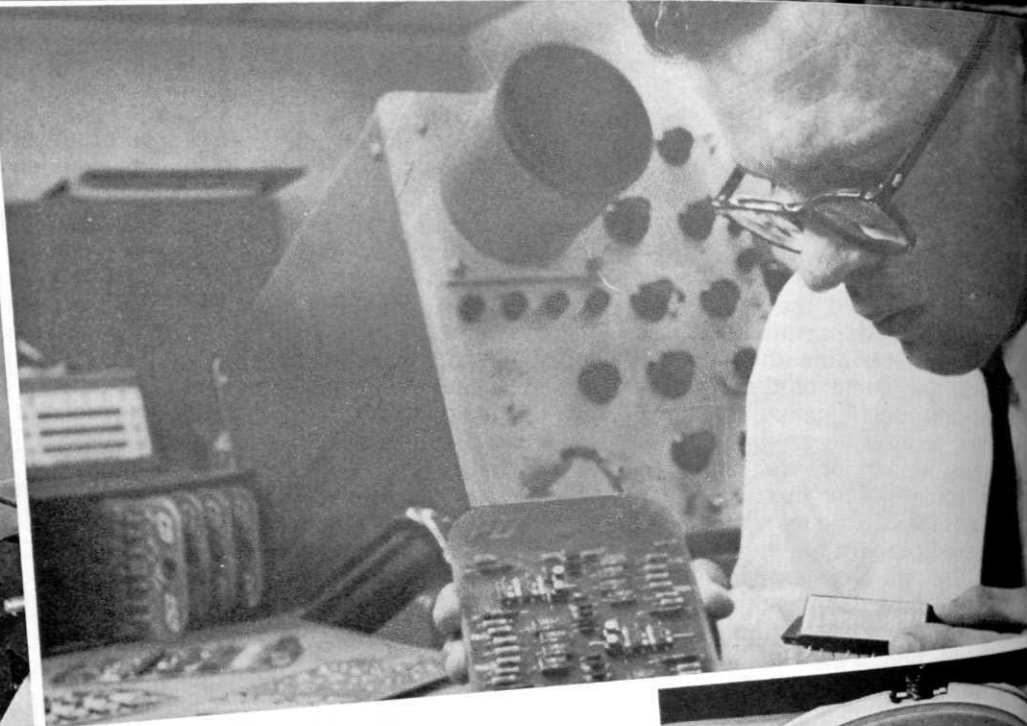
YRINTH

by **Andrew Levenfield**
and **Gary Romans**

tates with each new problem. There are no exams, although there is a quiz given when the report is due to make sure each member of the group has participated in the experiment. The last few periods of the term are used as a seminar in which each team will give a brief report on their problem so that each group will have the opportunity to discuss and learn what the other teams have done.

The chemical engineering department feels that there should be no complaints on the amount of

CONTINUED ON PAGE 43



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Get together with Delco Radio, the mover in electronics. Make no mistake—the pace is fast and demanding. But our people thrive on it. They're having a ball, pushing the state of the art clear out of sight in microelectronics and silicon devices. New research programs . . . new products . . . new equipment . . . and plenty of new opportunities for new people. Electrical Engineers. Mechanical Engineers. Physicists. Metallurgists. Physical Chemists.

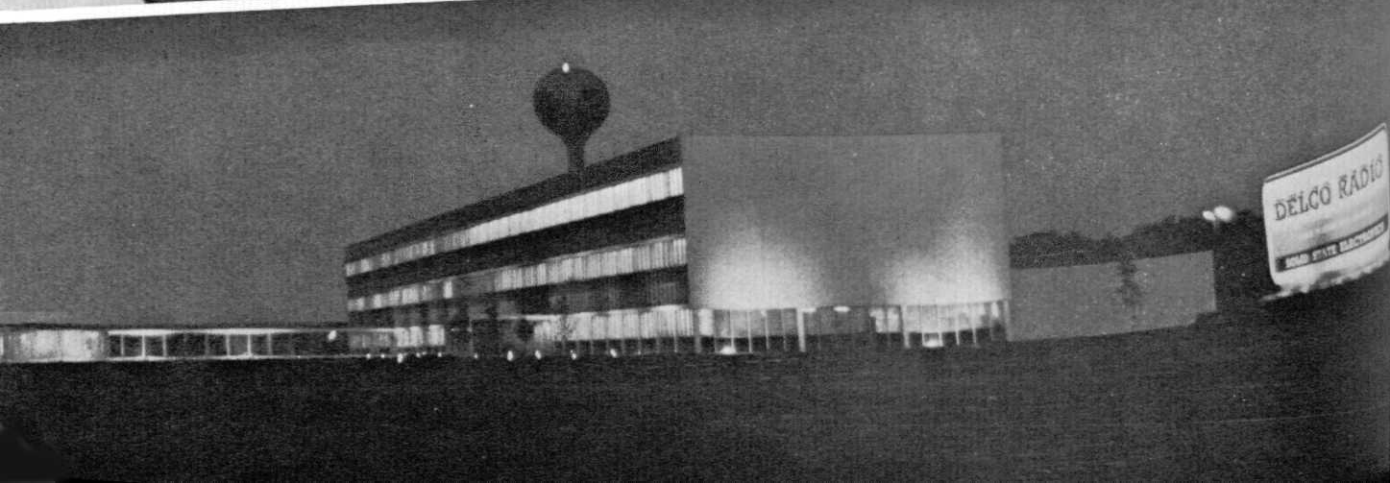
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Division of General Motors,
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MARK OF EXCELLENCE





Randy Trost, Wisconsin '67

"I never feel like a rookie"

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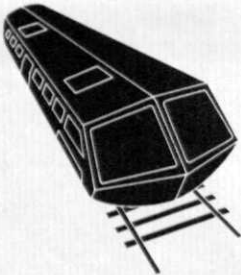
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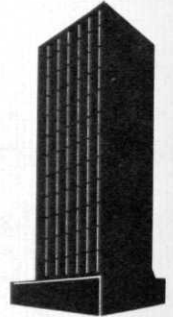
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IMAGE

OF AN

ENGINEER

REVISITED

by JIM BUSCHMAN

I should have known it would happen; there was just something in the air. It was exactly a year to the day since I met my friend the engineer there in the Crossroads Cafeteria at the International Center.* He had been in the process of change then. Unsatisfied with his image as an engineer, he had enrolled in classes in literature and art, philosophy and religion, home and family living. As we sat there, watching Wells Hall rise in the air, he had talked about his task. "We students in engineering are trying to get away from this old image of us that everyone seems to have," he had said, "-- the idea that an engineering major is a funnylooking guy who talks in formulas and wears a slide-rule on his belt. It isn't true anymore. We want to broaden our interests."

And now it was a year later. The engineers had come and gone at Wells Hall. A year ago there had been bulldozers and cranes; now, my window looked out on a beautiful building and a large, grassy part.

I glanced at the clock. It was ten-thirty in Saigon.

"Hi there," said an oddly familiar voice, and I looked up to find a total stranger.

"May I sit down?" he asked. That voice -- where had I heard it before? I stared at him, searching for a clue. He was immaculately dressed, from his yellow cashmere Arnold Palmer sweater to his cordovan Weejuns. He wore olive green checked slacks and a matching shirt with wide pin-stripes. His hair was long and

neatly combed, and he had a pair of carefully trimmed sideburns. And then I saw it; Hanging from his belt was a slide-rule. The handsome creature before me was My Friend the Engineer.

"Sure, sure, sit down," I answered. I was still sort of bewildered.

My friend flashed me a sincere smile and stuck out his hand. "God, it's good to see you again," he said, "How the hell are you? It's been a long time."

"It's been a whole year," I said as I reached out and felt my knuckles crack, "You've certainly changed."

"Well, yes," he said, "I've changed a few habits here and there. But it isn't just me. The whole Engineering Department is different now. We've found our cool. No more white socks and skinny ties for us. We're what's happening, baby."

"So I see," I answered. "But how did you manage to make the switch so fast? You must have worked awfully hard at it."

My friend shifted in his seat, and I could tell he was uncomfortable about this point. "Well," he began, "we engineers don't like to talk about the old days. We prefer looking toward the future -- you know, progress and all that. But I guess since you knew me back then I can talk to you. You remember what I used to be like."

I nodded, smiling as I recalled the young man with the crew-cut and bright orange sport shirt who had sat across from me a year ago.

"Well, we tried very hard to make the engineering student more

than just a queer-looking guy with a slide-rule. We wanted to stop speaking in mathematical equations. That's why we took all those courses from other departments. You remember -- like Op Art and Zen Buddhism. But we discovered that knowing all this weird stuff wasn't enough. In fact, it wasn't very important at all.

This interested me. "Go on," I said.

"Well, do you remember when I recited my poem for you last year, and everybody in the cafeteria heard it?" He looked down at the floor, obviously still embarrassed about the incident. "When I walked out, I heard people talking about me. And they didn't say, 'There goes the stupid poet' -- they said, 'There goes the stupid engineer who reads poetry.' They still knew I was an engineer."

"And what did that prove?" I asked.

"It proved that what other students really care about is appearance," he answered. "They don't care what you are, just what you look like and sound like. They don't care if you talk about circuits and trigonometry, just so you do it in a groovy way. We engineers realized this, and so we all started learning how to be suave and cool."

"How did you do that?" I asked him.

"Magazine subscriptions were a big help," he replied. "Naturally, we all got subscriptions to Playboy."

"Naturally."

"This helped us keep up on fashions, hairstyles, etiquette -- lots of things. I also subscribe to Esquire and Gentleman's Quarterly. As you can see, it's changed my appearance a lot. He waved his hand over the olive-green-and-yellow ensemble and turned his head to give me a good profile view.

"Very nice," I commented. "I notice your speech has changed too. How did you manage that?"

"We made tape recordings of fraternity rush."

"Oh."

"The only trouble," continued my friend, "is that being cool costs a lot of money. It gets expensive when a guy has to pay for a big wardrobe, and a car, and a luxury apartment, not to mention dinner dates, parties and of course a big liquor supply. But it's worth it."

CONTINUED ON PAGE 43



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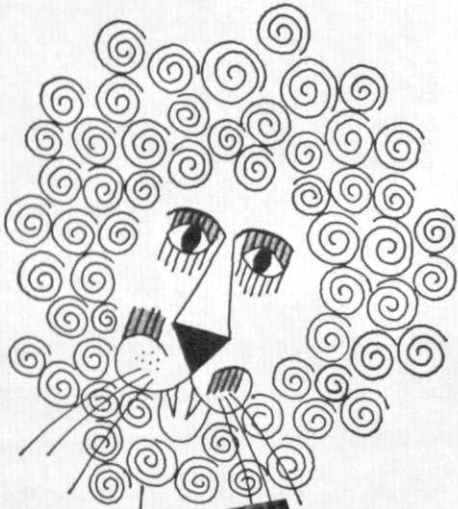


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HOW I SPENT MY SUMMER VACATION

Since summer employment is not as plentiful in engineering as full-time employment, it is not too early to begin searching for a summer technical position. The following are a few students who obtained technical jobs, and their opinions of their employment.

BILL SZALAY — Sr. EE

I spent last summer working in IBM's semiconductor development laboratory in E. Fishkill, N.Y. Working under the guidance of a Ph.D. in Electrical Engr. I studied the effects of surface conditions on beta degradations. The first three weeks were spent studying books and technical publications to determine what was already known in this area. The following weeks were spent in design of test devices, fabrication of these devices, and design of tests (i.e. stress conditions which the devices would undergo and measurement techniques). This was followed by the actual testing and the preparation of a paper describing what had been done and what was found.

With the invaluable experience, however, was the desolateness of the Fishkill area and the high cost of living in New York. My savings amounted to about half my earnings (\$436/mo.). I got the job in May by interviewing at the Placement Bureau.

ROBERT KAATZ — Sr. EE

My job was as a staff member in two privately owned camps, one in Cleveland, Georgia and one in Shelby, Michigan. My assignments had considerable variation, such as maintenance of electrical and mechanical equipment, waterfront director, teacher, assistant in charge of monetary affairs, general laborer, counselor in a cabin, camp director (for a short time), and public relations work. My wife and I were appointed after meeting the executive director of Bible Memory Association which owns these camps as well as two others. Our wages totaled \$120 per week plus room and board. Since my work was not con-

nected with my studies in EE, I didn't learn much in that area. The main advantage, I feel, was in my relations with people. This type of thing can't be learned in a classroom and thus the many opportunities that were afforded me in camp enabled me to improve myself somewhat in this important area. As college graduates, we will be "expected" to take leadership roles in our society, and the experience gained at camp is good for the development of such qualities.

In our complex society it becomes increasingly difficult to experience a true sense of achievement. This type of work offers the greatest possible challenge -- working with people. In the camps where I worked people were influenced and directed, we trust, for the better. I know of no other area that gives such a thrill, and, therefore, I recommend very highly this type of work.

AL THROOP — Sr. EE

This past summer I was fortunate enough to obtain employment with the IBM corporation, working in Poughkeepsie, N.Y., a small city two hours north of New York City. As my project this summer, I investigated the effects of certain parameters on the thermal operating characteristics of the resistor modules that IBM uses in their computers and other machines.

My first few weeks were used to acquaint myself with the different technologies developed to make the modules, the advantages and disadvantages of each, and what was known of their characteristics at that time. It was then necessary to develop tests that would reveal the effects of geometry, distribution, environment,

etc. on these characteristics, as well as the thermal profile of the module. The results of this study would hopefully allow IBM to predict with more reliability the performance of existing modules in various machine applications, generate optimum designs for new applications, and provide realistic guidelines for optimum network layout.

I obtained the job by interviewing at the Placement Bureau, plus having some inside help at Poughkeepsie. IBM was a very impressive company to work for. In spite of its size, the companies concern extended to each individual, and as a result, IBM seemed very employee conscious. Almost without exception, all the employees I associated with this summer were happy with IBM, though each had worked with other large concerns before. The only detriment I could find was the Poughkeepsie area. The opportunities for outside activities were very limited, especially since this summer seemed to be the monsoon season in New York. It was an especially cool, wet summer and left much to be desired. In all fairness, though, I think the situation may have been different had the stay been permanent.

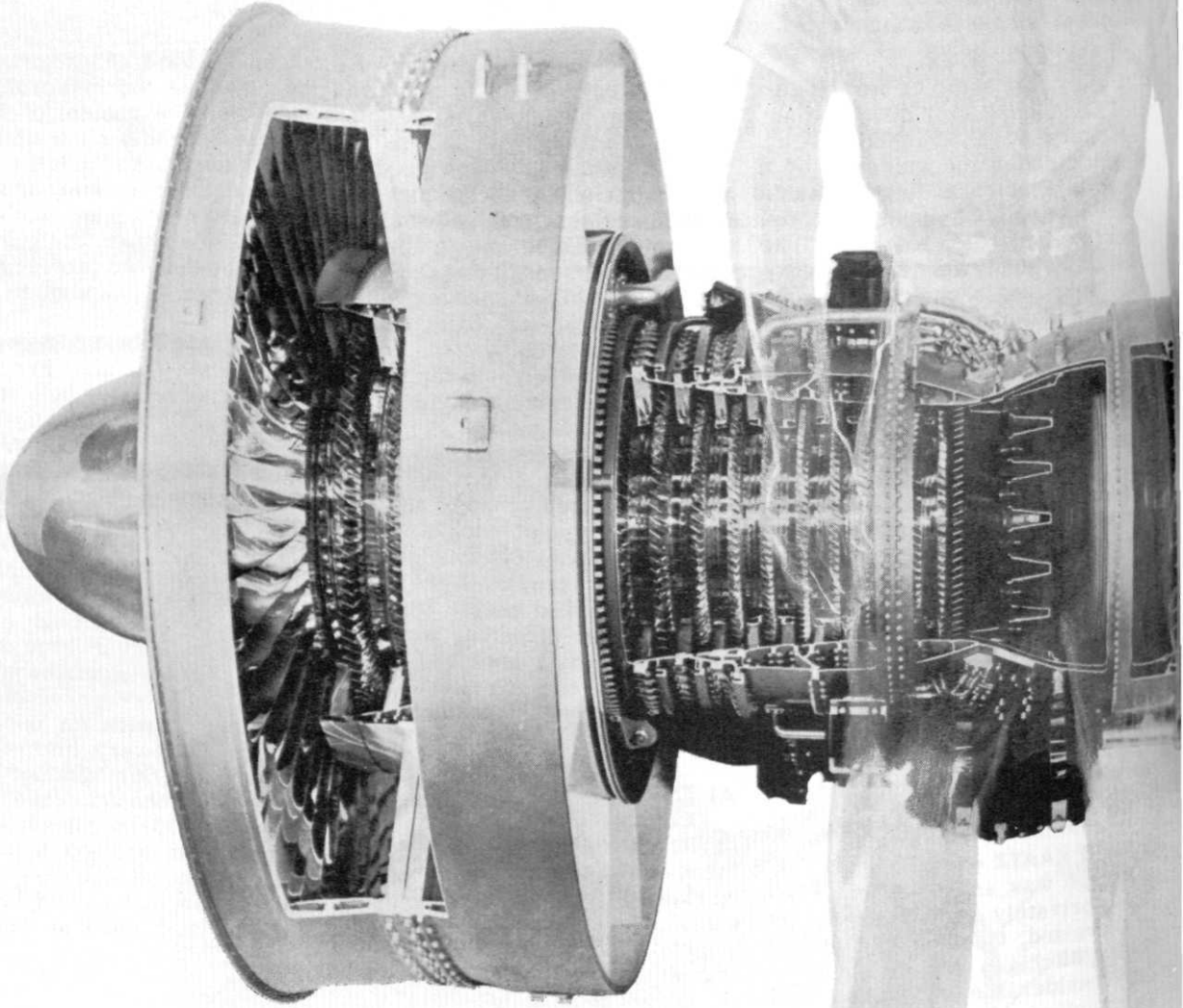
THOMAS HAVEL — Sr. ME

This summer I worked as a student engineer for the Detroit Edison Company. I received the job after talking with their representative at the Placement Bureau.

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CONTINUED ON PAGE 48

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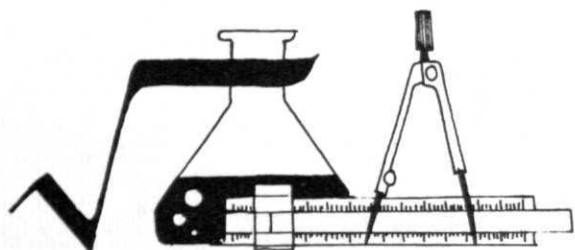
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NASA
Abbott Labs
Reliance Electric & Engr. Co.
Illinois Tool Works
Air Reduction
ElectroVoice
Federal Mogul Corp.

Sangams Electric Co.
Continental Can Co.
General Dynamics - Electric Boat
Div.
General Electric
United Airlines
Airborne Instruments
W. Virginia Pulp & Paper
Sperry Gyroscope
Reynold Metals
The Prestolite Co.
Bell Aerosystems
National Casting
Automatic Signal Division - Labor-
atory for Electronics
American Standard (Industries
Div.)
Sprogue Electric Co.

WEEK OF JAN. 15 – JAN. 19

Cutler Hammer
Stouffer Chem.
Gallo Wine
Carrier Corp.
N.Y. Air Brake Co.
Cadillac Motors
U.S. Atomic Energy Comm.
Joseph & Seagrams & Sons Inc.
Excello Corp.
St. Regis Pulp and Paper Corp.
Racine Hydraulics And Machinery
Inc.
United Aircraft Research Lab.
Esso-Humble Oil
McDonnell Aircraft
Boeing Co.

WEEK OF JAN. 22 – JAN. 26

General Electric
General Motors
Vick Chemicals
Ingersoll-Rand
Morse Chain Co.
Alcoa Aluminum
Corning Glass Works
Pittsburgh Plate Glass
Hamilton Standard
General Radio Co.
Deere & Co.
NASA
General Dynamics
Control Data

Cleveland Electric Illuminating
Union Carbide
Taylor Instruments
Warwick Electronics
Vestal Chemical Labs
Scott Paper Co.
Consumers Power Co.
Sylvania
Dow Chemical Co.

WEEK OF JAN. 29 — FEB. 2

Eastman-Kodak
North American Aviation
Baxter Laboratories
3M Co.
Philco Co.
Sperry Phoenix Co.
Ingersoll-Rand
Interlake Steel Co.
U.S. Steel
Hercules Inc.
Burroughs
Brunswick
Cummins Engine Co. Inc.
Sherwin Williams Co.
Detroit Edison
R.C.A.
Toledo Scale
Idaho Nuclear Corp.
Whirlpool
Armco Steel
Jet Propulsion Labs
Mobil Oil
Timken Roller Bearings
Cornell Aeronautical Labs.
Youngstown Sheet and Tube
Hupp Co. - Gibson Refri. Div.
American Airlines
Marshall Space Flight Center
Mississippi Valley Structural Steel
Owens-Corning Fiberglass Corp.
Gulf Research & Development
Emerson Electric

WEEK OF FEB. 5 — FEB. 9

Eli Lilly Co.
Dow Corning
Vick Chemicals
Borg Warner Research
Youngstown Sheet and Tube
Kelsey Hayes
Continental Motors
Borg Warner
Lear Siegler Inc.
Pullman Inc.
American Oil Co.
B.F. Goodrich
National Cash Register
Charmin Paper
Univ. Of Michigan (Inst. of Science
& Tech.)

Marathon Oil
Bunker Ramo Corp.
Xerox
F.M.C. Corp.
Pittsburgh-Des Moines Steel Co.
Peoples Gas
Kimberly Clark Corp.
Pure Oil
Dow Chemical
Westinghouse Electric Corp.
The Mead Corp.
International Harvester
The Budd Co.
International Paper
Sinclair Research
U.S. Steel Corp.
Sinclair Refining
Wright Patterson AFB. (Aeronau-
tical Systems)
Hewlett Packard
Inland Steel
National Steel
Masonite Corp.
American Can Co.
Goodyear Tire & Rubber
Humble Oil

WEEK OF FEB. 12 — FEB. 16

Hughes Aircraft
Bendix
Collins Radio
Bell Systems
Radiation Inc.
Continental Oil Co.
Miles Labs
U.S. Naval Ordnance Test Station
Weyerhaeuser Co.
Douglas Aircraft
Automatic Electric Co.
Leeds and Northrup
Vicks Chemical
Caterpillar Tractor
Hamm's Breweries
Procter & Gamble
Olin
Grumman Aircraft
Honeywell Inc.
New York Central
Firestone Tire & Rubber
TRW Inc.
Philco - Aeronautics Div.
Magnavox Co.
Owens-Illinois
International Milling
Motorola
Union Electric

WEEK OF FEB. 19 — FEB. 23

Chrysler
P.R. Mallory & Co. Inc.
Lockheed, Missile and Space

Aerojet General Corp.
DuPont
Bendix
American Electric Power Ser-
vice Corp.
Ohio Lime Co.
U.S. Army - Corps of Engineers
Dewey & Almy Chemicals
Northern Natural Gas
U.S. Plywood Corp.
U.S. Naval Air Test Center
International Mineral & Chemical
IBM
Kaiser Aluminum
Standard Oil of California
Allis Chalmers
Ford
Cooper Tire & Rubber

WEEK OF FEB. 26 — MARCH 1

Pratt & Whitney Aircraft
Texaco Inc.
R.J. Reynolds Co.
Fairchild Camera And Instrument
Corp.
Sparton Electronics
Anaconda Wire and Cable
U.S. Naval Weapons Lab.
Libby-Owens-Ford Glass
Shell Oil
Chev. Flint Mfg. Co.
SCM Microstatic Div.
NASA
General Electric
Republic Steel
Square D Co.
LTV Aerospace
Sundstrand Corp.
Toledo Edison
Lockheed
Colgate Palmolive
Cadillac Gage Co.
Lear-Siegler Inc.
Scott Paper
Lawrence Radiation Lab.
Industrial Nuclonics
Texas Instruments Uniroyal

WEEK OF MARCH 4 — MARCH 8

Tocco Induction Heating
Union Carbide
General Motors
Hercules Co.
TRW
U.S. Army Engineers
National Twist Drill & Tool
Interstate Electronics
Humble Oil & Refining
Amoco Chemicals Corp.
U.S. Gypsum
Amer. Bosch Arma. Corp.
Dana Corp.



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cruiting team will get in touch with you to talk about the whys, whats and wherefores of a Bell System engineering career.

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York, New York 10007.



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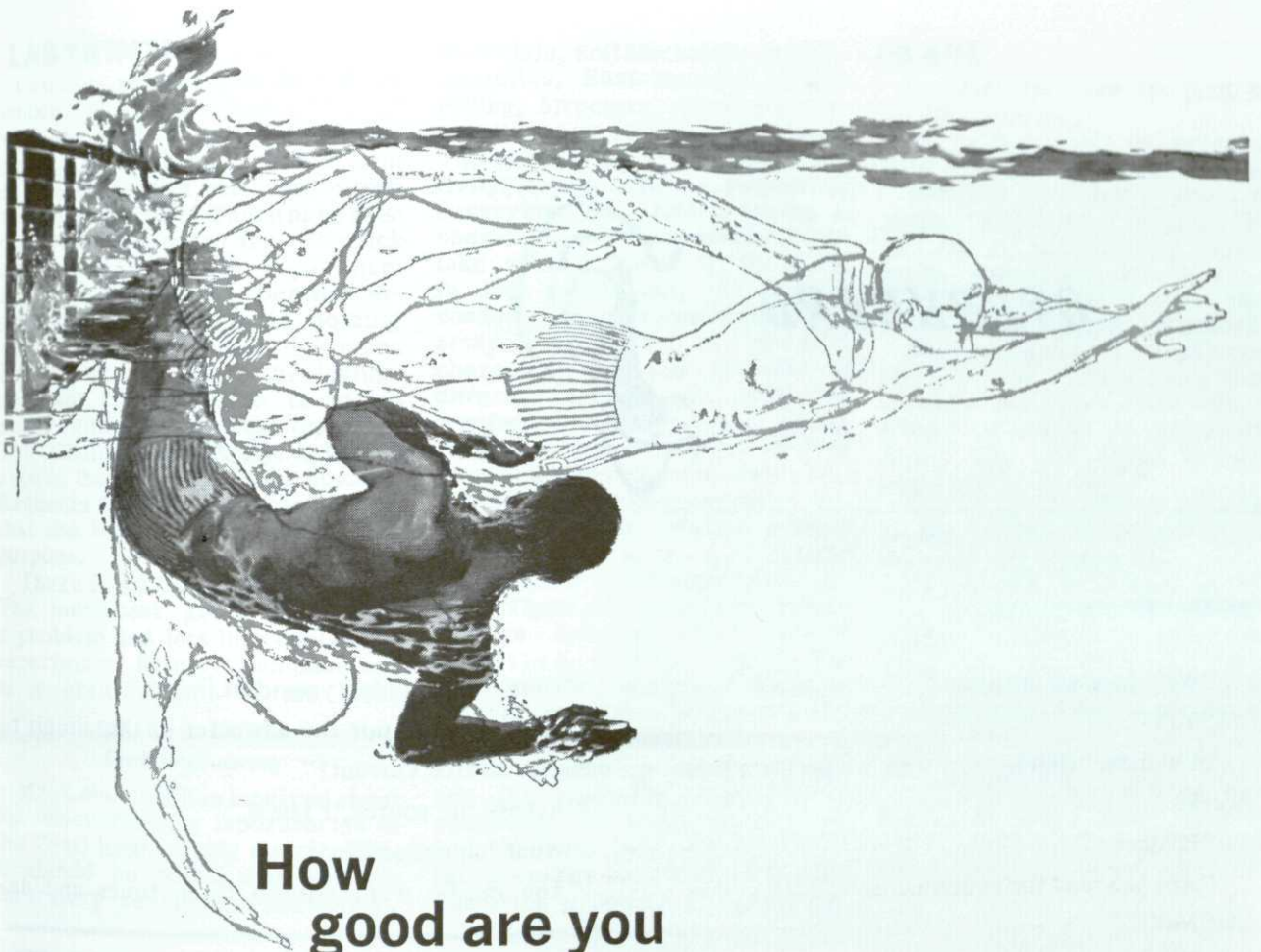
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OVERHEARD



IN E. E. LAB.

"Well, here we are again."

"Yah."

"I wonder what kind of orgy we perform this week?"

"Beats me."

"Anyone read the experiment yet?"

"No."

"Not me."

"I did."

"Darn you, Taylor. You know the rules of our club. Nobody reads the experiment until fifteen minutes after the period starts."

"I must have been out of my mind."

"I guess we might as well get this show on the road."

"Where do we plug this?"

"Try your ear!"

"It says here, 'From your knowledge of the oscilloscope gained in previous experiments, connect the scope into the circuit shown, so the fluctuation across the unilateral filibuster may be observed.'"

"What's a unilateral filibuster?"

"Beats me."

"I'm snowed."

"This must be it."

"That's my eraser."

"It says here, 'Plot the suicidal source current as a function of time.'"

"That's sinusoidal, you idiot."

"Where do we put the ammeter in the circuit to measure source current?"

"Across the source, I guess."

"What happened?"

"The needle went around three times and disappeared."

"Try a bigger meter."

"That needle just went around twice and melted."

"They don't make meters like they used to."

"Which one of you guys is taking down the data?"

"I thought you were."

"We don't have any data yet."

"We'll have to fudge that into the report."

"What kind of curve should we use this week for our graphs?"

"I always had good luck with the one with a big sag in it."

"Yah, that one always works great."

"What happened to Taylor?"

"I charged up that big capacitor and touched one wire to each of his ears."

"Get off the floor and stop goofing off, Taylor."

"Here's some numbers on this piece of paper. They look good enough for data."

"These last eight parts don't work so let's check

OUT."

LABYRINTH . . .

credits received. It is not the amount of credits that count but what a student gets out of the course. If there is a complaint on the content of the course then this is justifiable. There have been complaints made to Dr. Chetrick about the chemistry department labs required of chemical engineers, but he can do nothing about these. The reason that more credits are given to the lecture sections is that there is not as much work involved in the labs. The Chem.E. lab is designed to arouse the curiosity in the student. Requests for night labs have shown that the lab is accomplishing this purpose.

There is no cookbook type of lab. The instructor gives the student a problem and lets him design the experiment. Safety is emphasized to a great extent in the labs.

DR. C. E. CUTTS
Civil Engineering

Mr. Levenfeld has inquired about the undergraduate laboratories in the Civil Engineering curriculum. It should be noted that we have laboratory sessions in Surveying,

Materials, Soil Mechanics, Hydrodynamics, Environmental Engineering, Structural Synthesis, Hydraulics and Highway Facilities. The purpose of the laboratory activity varies with the subject. In Surveying, the student learns to operate transits and levels and to take measurements in the field. In Soil Mechanics, the student conducts experiments in the laboratory and studies the physical characteristics and behavior of different types of soil. In Hydro-mechanics laboratory the student observes the phenomena of fluid flow and takes measurements on a number of flow phenomena.

In the Senior Year, a number of our laboratories are related to analysis and design of facilities. These are essentially calculation sessions which develop creative thinking, engineering judgment and analytical skills in solving problems facing the engineering profession.

The laboratory activity broadens the student's experience in observing and measuring physical and chemical phenomena and better prepares him to solve the engineering problems of tomorrow.

IMAGE . . .

I asked him how he paid for all his activities.

"I work a lot," he answered, "I'm a busboy in the Union Grill."

Suddenly my friend looked at the clock. "Oh, damn," he said, "I'm late for my hairdressing appointment. I've really got to go -- it's been almost a week since I had my sideburns trimmed."

This surprised me. "Wait a minute," I said. "Aren't you going to show me your slide rule, or some pictures or something? Aren't you even going to recite some poetry for me?"

The word "poetry" stopped him in his tracks. He leaned across the table and whispered:

"Don't tell my advisor, but I'm still writing poetry. Of course, I stopped reciting it in public. But stop by the apartment sometime and I'll give you a private reading of my latest work, 'Metallurgy At Midnight.' I consider it my masterpiece. See you later."

And with that he was gone, leaving me to ponder over those famous words of the Brooklyn Dodgers, "Wait till next year . . ."

STRENGTH

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Malleable castings are available in two general types (ferritic and pearlitic) and in 9 ASTM grades that range in tensile strength from 50,000 to 100,000 PSI. Tensile strength figures represent the load at which materials fail. Yield strength and fatigue strength are among the more important engineering yardsticks.

Yield strength represents the point at

which materials exceed the elastic limit. Fatigue strength is the greatest stress which can be sustained when the load is applied repeatedly. As indicated by the table below, Malleable has an advantage over steel in fatigue strength and yield strength when grades of identical tensile strength are compared.

	TENSILE	YIELD	FATIGUE
1020 Steel	75,000 PSI	48,000 PSI	34,000 PSI
50007 Pearlitic Malleable Iron	75,000 PSI	50,000 PSI	37,000 PSI

Strength and Cost — Malleable iron has been described as providing more strength per dollar than any other metal. There are many factors which contribute to this

reputation. Malleable can be cast close to finish shape, thereby reducing or eliminating machining operations. What machining must be done can be accomplished quickly because Malleable iron is the most easily machined of all ferrous metals of comparable hardness.



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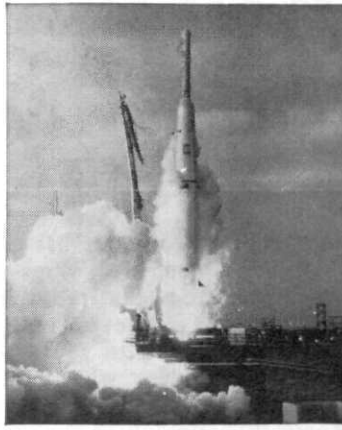
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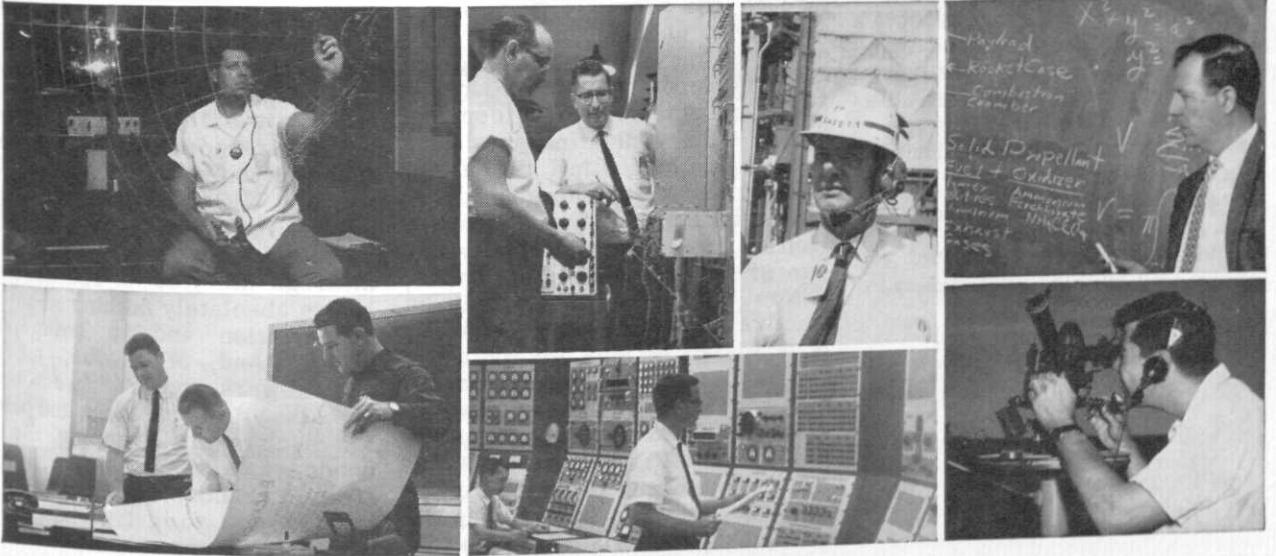
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Last year around the first of November, I received, by letter, an invitation to join the Tau Beta Pi Association, which, according to the letter, was an honorary organization dedicated to the recognition of outstanding scholarship among undergraduates in all fields of engineering and various other high-minded goals and ideals. By changing only the name on the letterhead and the field of recognition, it could have been made virtually impossible to distinguish this letter from half-a-dozen others which I have received or seen from various organizations with either Greek titles or similar indecipherable nomenclatures. Now, upon completion of this essay and several other lip-service tasks (such as spending a weekend filing a hunk of bronze to smoothness; a definite mind-improving task), I shall become a part of the Tau Beta Pi Association, and next year be one of those responsible for the dissemination of similar letters to other aspiring engineers. Thus the wheel will come full circle, and be repeated again and again, in the same cycle.

But wait! Let's stop and examine this endless pinwheeling for

a moment. Throw out all of the high-minded, but for the most part empty, pious platitudes being voiced about Tau Beta Pi (or any other honorary, with few exceptions) and consider what's really happening. Each year, Tau Beta Pi and its numberless counterparts recruit new members with high-minded statements and a week of generally purposeless activities ingeniously contrived by the actives of the organization, mostly to get back at the new pledges for what they had to go through the previous year. After this week of such activities, the new pledges are "initiated" into full membership in the organization in ceremonies which, depending on the organization, may vary from something similar to early pagan rites at Stonehenge to atrocities somewhat comparable to activities some twenty-five years ago at a place called Auschwitz.

Now that the new pledge is an "active", what has he got? Well, if he wishes he may, depending on the organization, attend a meeting or two a month to discuss basically plans for the next pledging and initiation ceremonies. Perhaps a dinner or dance for the members may be held during the year, and, more unlikely, an important speaker in the field of recognition may speak to the or-

ganization and exhort them to higher goals or similar ends. But most important, the member now has three more Greek letters to tack on the end of his name, and perhaps one more certificate to hang on his wall, or even another pin to wear on his suit jacket. Here is the only real tangible value of the usual honorary. Haven't we all had the pleasure of having someone ask "Gee, what's that pin you're wearing?" and answering "Oh, that's my Alpha Sigma Sigma pin.", and having the person look properly impressed, although in 99 out of 100 cases he knows absolutely nothing about the organization and is being only polite? And, of course, job interviewers and graduate schools are always great places and people for such name dropping. So the honorary is of some value, if only from the monetary standpoint of helping one to get a better job when one leaves school.

All of this leaves something to be desired, however, in my opinion. Somewhere back when it all began, before the ball got to rolling on inertia alone, each honorary, Tau Beta Pi included, actually meant something of what it claims to mean in its flowery statements to its members. It actually was something of great internal personal value and honor to its members, rather than just another bunch of Greek letters. But then, I guess that's not my concern. Why rock the boat?

What

IS

an

honorary?

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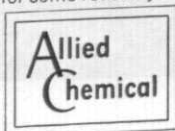
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Then there's another kind of student engineer. He's in college somewhere completing his degree. He strives for the top grade in his class. And usually makes it. He has no intention of calling his education quits when he graduates. He's got his feet on the ground and his eyes on the stars. He, too, may one day be one of our best engineers.

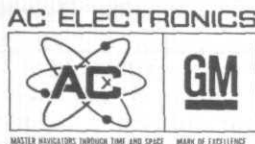
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VACATION . . .

relating to his major field of study. The company awards a one-year tuition scholarship to a student who distinguishes himself during his summer job.

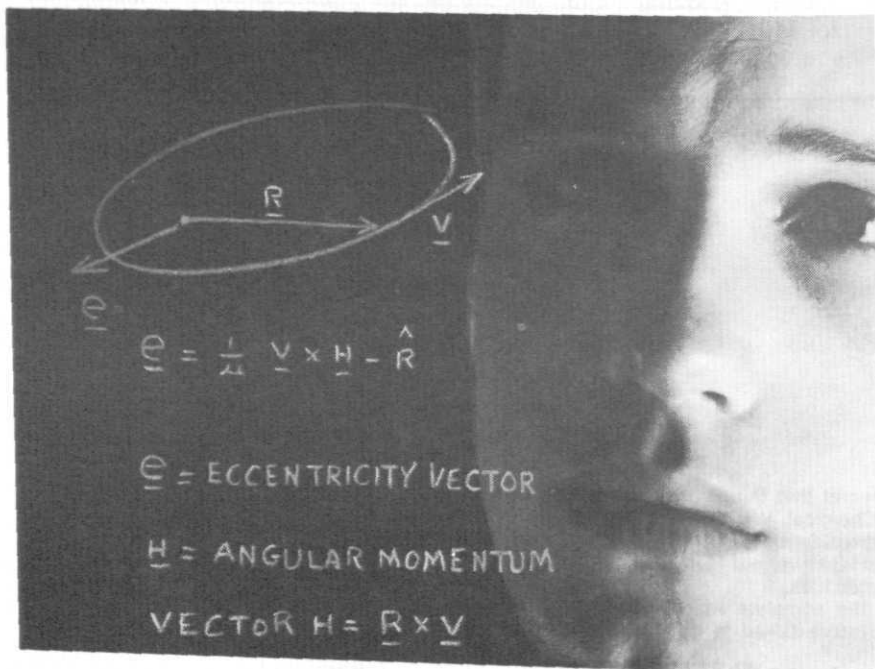
My work in the Generation Division of General Engineering consisted mainly of three assignments. I wrote my report on the economic feasibility of a peaking system which stored liquid air during the off-peak hours and then vaporized it to turn a turbo-generator during the peak hours. I also worked on compiling net heat rates for the individual units in the Edison system to determine if a computer program, which predicted future fuel costs, was using correct data. My final assignment consisted of preparing a curve which would permit a plant operator to use the most economical number of condenser circulating pumps for a particular operating load and inlet water temperature.

GARY ROMANS — Sr. EE

I spent the summer in the Microwave Department of Western Electric Co. in Rolling Meadows, Illinois. I obtained the job by an interview at the Placement Bureau and was paid \$450/mo.

The work did not require a great amount of technical background. My main assignment was to prepare the path loss calculations for an ETV system being constructed in Indiana for Purdue University. I spent approximately 13 hours per week in classes at the plant. I was given one course in Basic Telephony and one on the 100A switching system used by Western Electric.

The main benefit of this job was the chance to find out what working as an engineer is really like. After spending a few years taking theoretical course it was gratifying to be able to go out into the field and be paid for using some, even though it was little more than MTH11, of the things I have been taught in engineering.



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REMEMBER WHEN?

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We need competent, imaginative, flexible individuals. Because we’re that kind of company. We encourage our people to take risks, to find novel—even off-beat—approaches to technical, managerial and marketing problems. We believe that only a bold, creative staff can contribute to the continued growth of a corporation that is already bold and creative.

Maybe that’s why Chemical Week magazine, in awarding us the Kirkpatrick Award for Management Achievement, titled the article “Portrait of a Winner.” And wrote “Keys to Celanese Corporation’s victory: an alert, aggressive management team, explicit planning and well-defined roles.”

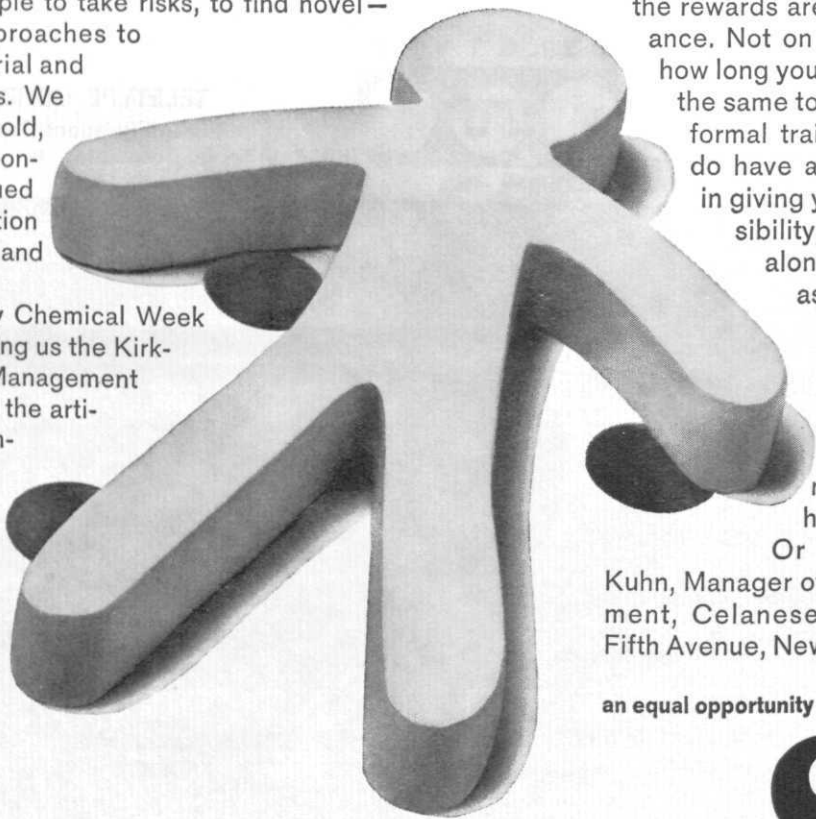
If you have a professional degree in chemistry, chemical, mechanical or industrial engineering, physics or marketing, Celanese has a lot to offer you.

Frankly, we also expect a lot. But the rewards are based on performance. Not on how old you are or how long you’ve been with us. By the same token, we do not have formal training programs. We do have a very deep interest in giving you as much responsibility, and in pushing you along just as fast and far as you can go.

If this sounds good to you, discuss us with your faculty and placement officer. And see our representative when he is on your campus.

Or write to: John B. Kuhn, Manager of University Recruitment, Celanese Corporation, 522 Fifth Avenue, New York, N.Y. 10036.

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These U.S. Air Force officers are getting what they want out of life. You can be one of them.

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ENGRINEERS

The weird scientist looked over reports on his life-preserving tonic. "Hm m m m m m m . ." he mused, "I see where my elixir has had its first failure -- a ninety-eight year old woman. Ah, but what's this? They saved the baby."

SE

Overheard in Dean's Office -- Dean to engineering student: "Aren't you ashamed to be seen here so often?"

Student: "Why, I've always thought of this as a respectable place."

SE

A sheriff rode up to a group of poker-playing guys in a western town, and looked at them from his trusty mare. One of the players looked up and said:

"Care for a little stud?"

"Don't mind if I do," replied the horse.

SE

The engineers have a new game they play. Three guys rent a motel room and they all bring a quart of Cactus Jack with them. They sit and drink for an hour, then one of them gets up and leaves. The other two have to guess which one left.

SE

Hit by a speeding midget sports car as she was strolling across a country road, a little hen got up, smoothed down her feathers and muttered: "Lively little cuss, but he didn't get anywhere."

SE

Critic: "It strikes me as being an impressive statue, yet isn't that rather an odd posture for a general to assume?"

Sculptor: "It isn't my fault. I had the job half done when the committee decided they couldn't afford a horse."

First M.E.: "And what are you doing now?"

Second M.E.: "Buying old wells, sawing them up, and selling them for post holes."

SE

Thermometers aren't the only things that are graduated and have degrees without having any brains.

SE

"You know what Lady Godiva said as she rode through the streets of London bareback and naked?"
"Oh what a cool saddle!"

SE

Of course you're the first girl I ever kissed," said the senior EE as he shifted gears with his foot.

SE

An Englishman returned to his home after a trip to America, and was telling his friend of the odd American games.

"One of the queerest games is called 'Oh Hell' I think,"
"Oh Hell?" he said, "how do they play it?"

"Well, everyone is given a card with a lot of numbers and then a man yells out the numbers. Suddenly someone yells 'Bingo' and everyone else yells 'Oh Hell' . . ."

SE

The difference between a married man and a bachelor is that when a bachelor walks the floor with a babe in his arms, he's trying to sober her up.

SE

Engineer: "I'm not feeling myself tonight."

Coed: "You're telling me."

A space traveling martian, after trying in vain to get the pumps in a gasoline station to talk, gave up in disgust and reported back to his commanding officer. "Sir, you're not going to believe this," he said, "not only do they just stand there without saying a word . . . but you'll never guess what they stick in their ears."

SE

The none-too-bright Chem. E. had been dating the same girl for over a year when one evening the girl's father confronted him and wanted to know whether his intentions toward his daughter were honorable or dishonorable.

"Gee," said the young Chem. E. swallowing hard, "I didn't know I had a choice."

SE

C.E.: "Do you believe in free love?"

Coed: "I haven't sent you a bill, have I?"

SE

Then there was the engineer who couldn't spell who spent the night in the warehouse.

SE

It is rumored that one E.E. professor recently became aware that his class had drowsed off on him, and he decided that he would catch everyone off guard. He suddenly dropped into double-talk.

"You then take the loose sections of feathered smiggs and gweld them, being careful not to overheat the broughtabs. Then extract and wampt them gently for about a time and half. Fwengle each one twice, then swiftly dip them in blinger, if handy. Otherwise, discriminate the entire instrument in twetchels. Are there any questions?"

"Yeah," came a sleepy voice from the back of the room. "What are twetchels?"

jokes . . .

While driving thru a great American desert, an engineer noticed a sign on the road which read "Queer Town; Population Two." Seeing only a single gas station, the engineer became curious. He drove into the station and was greeted by the husky attendant.

"Mister. What does that sign up the road mean?" queried the engineer.

The attendant perceiving the sign, became perplexed. "I don't know," he answered, "But wait here, I'll ask my wife Ralph!"

SE

Ch.E.: "I had a frightening dream last night."

C.E.: "Is that the truth? What was this dream about?"

Ch.E.: "I dreamt I was born to Jane Mansfield and the doctor put me on a formula."

EE -- "Who spilled the mustard on my waffle?"

Wife -- "Oh, Jim! How could you? This is lemon pie!"

SE

Kissing a girl is just like opening a bottle of olives -- the first may come hard, but it's a cinch to get the rest.

SE

Two hip M.E. were crossing the Atlantic by steamship. They were out on deck, looking at the ocean, and one said, "Man look at all that water out there!" "Yeh, man," the second, fartherout M.E. replied. "And just think, like that's only the top of it."

"How do you get down off an elephant?"

"You climb down."

"Wrong!"

"You grease his sides and slide down."

"Wrong!"

"You take a ladder and get down."

"Well, you take the trunk line down."

"No, not quite. You don't get down off an elephant; you get it off a goose."

SE

Girl: "Every time I look at you I think of a great man."

Boy Friend: "You flatter me. Who is it?"

Girl: "Darwin."

SE

Spring: When a young man's fancy lightly turns to what the girl has been thinking about all winter.

CIVIL ENGINEERS:

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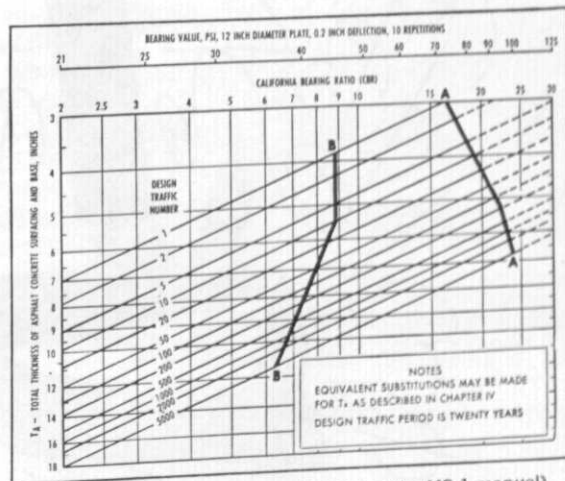
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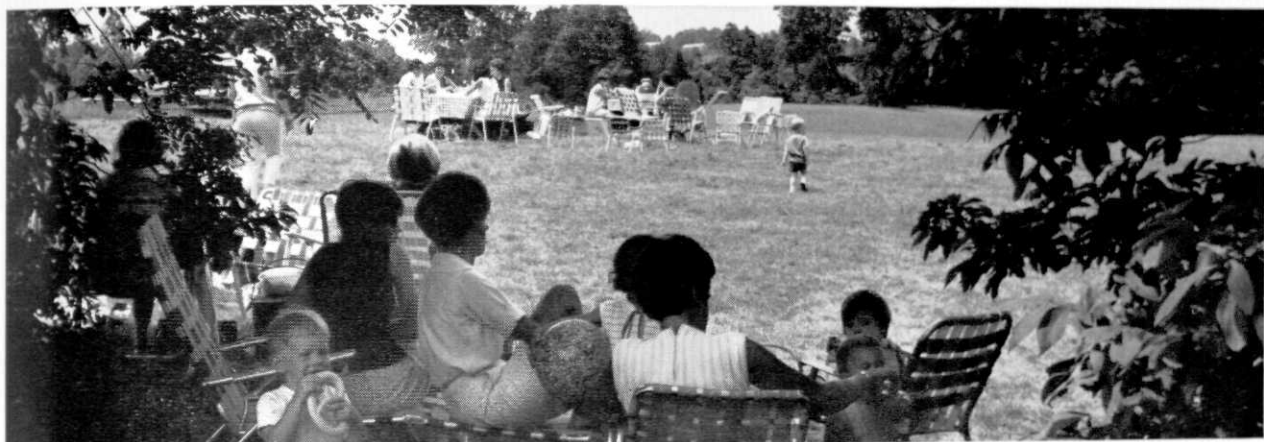
**Or write to Manager of Personnel, Bethlehem Steel Corporation, Bethlehem, Pa. 18016.*

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BETHLEHEM STEEL



Here in the hills of East Tennessee we are known as Eastman and the atmosphere is sort of different



Ladies' picnic on a Thursday afternoon in Warrior's Path State Park near Kingsport, Tenn. Down in the valley the chemical engineering is as up to date as any on earth, but the tensions of the big cities seem slow to penetrate the hills of East Tennessee. Some call this isolation and like it. Some wouldn't. We offer choice.

You may have first heard of Kodak when you were eight years old and grandpa pointed a camera at you. In Kingsport, Tenn., Longview, Tex., and Columbia, S.C., there are 15,000 of us who make no cameras and no photographic film but turn out fibers, plastics, and chemical ingredients for a hundred other industries. In fact, we can offer no less a variety of chemical engineering opportunities in those communities than in Rochester, N. Y., where we produce our renowned photographic goods for enjoyment, for business, for education, and for the professions.

Although many Kodak chemical engineers eventually move into production or management functions, none start there. First assignments are in development and process improvement, or systems and research. A chemi-

cal engineer might also make full use of his professional competence in liaison with our customer companies, in which case he is in marketing and had better count on moving around quite a bit. Otherwise we are so set up that we can give an engineer all the opportunity for advancement he wants without ever asking him to change communities.

We make the same promise to mechanical, electrical, and industrial engineers, by the way.

Drop a note about yourself to Business and Technical Personnel Department, Eastman Kodak Company, Rochester, N. Y. 14650. If you have any geographical preferences or any other category of preferences in work, mention them. We are an equal-opportunity employer.

And here, just to be specific, are what occupy the chemical engineers down in the valley:

RATHER SPECIAL

- Solid-phase polymerization
- High-temperature vapor-phase pyrolysis
- Liquid-phase air oxidations
- Non-Newtonian flow
- Drying of tacky pastes
- Extrusion of hot, viscous, temperature-sensitive materials
- Design of systems for melt- and solvent-spinning
- Oxidation of ethylene to acetaldehyde and ethylene oxide
- Oxo process
- Olefin polymerization
- Vapor-phase dehydrogenation

MORE GENERAL

- Design of pilot plant and plant equipment from laboratory data and basic chemical engineering unit operations
- Drying operations for fibers, plastics, and chemicals
- Viscous flow and heat transfer
- Chemical kinetics rate models
- Dispersion systems
- Mixing studies
- Use of computer hardware and software in plate-to-plate distillation program, hydraulic design, heat-exchanger design, mass transfer equipment design, reaction simulation

Kodak



“Traffic is terrible today!”

“... Accident in the left hand lane of the Queens-Midtown access ramp. Right lanes moving slowly. Fifteen minute delay at the Brooklyn Battery Tunnel. Lincoln Tunnel backed up to the Jersey Turnpike. Extensive delays on Route 46 in the Ft. Lee area. That's the traffic picture for now, Bob.”

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Young engineers at GE are also working on the solutions to thousands of other challenging problems—products for the home; for industry; systems for space exploration and defense. When you begin considering a career starting point, think about General Electric. For more information write for brochure ENS-P-65H, Technical Career Opportunities at General Electric. Our address is General Electric Co., Section 699-22, Schenectady, New York 12305.

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