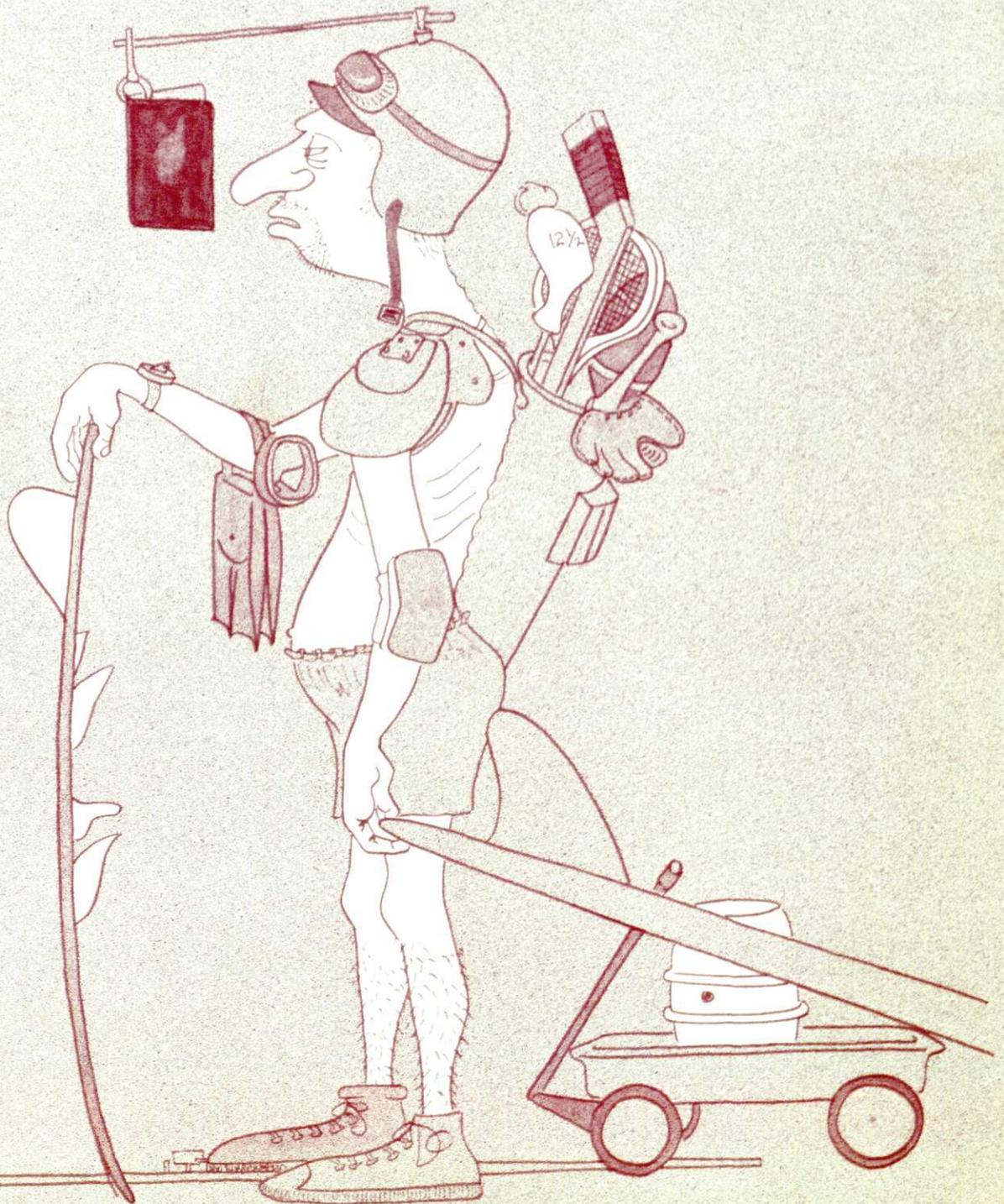


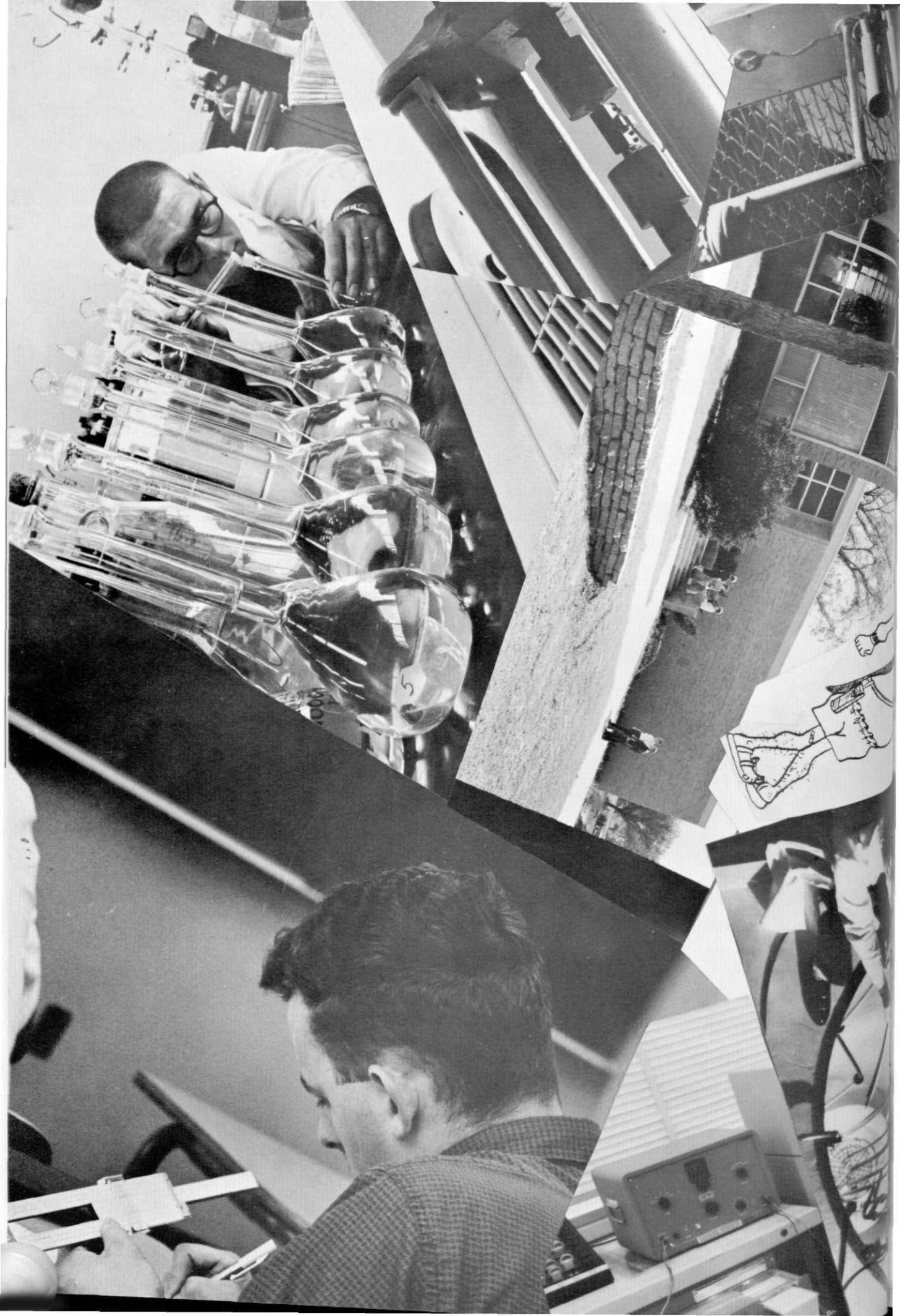
SPARTAN ENGINEER



JANUARY, 1969

25¢





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Here are 6 good reasons why your career gets off to a faster start that carries you farther at ECI in sunny St. Petersburg, on Florida's sub-tropical Gulf Coast.

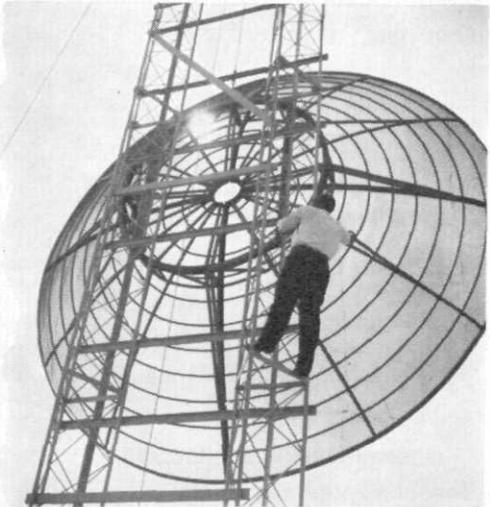
1. **IMPORTANT PROGRAMS** — ECI has a reputation for pushing the state-of-the-art in electronic communications and developing sophisticated equipment and systems that exceed specifications. For instance, ECI developed the world's first 1-KW airborne UHF transmitter, the first airborne electronic switching system and the first solid-state multiplex system designed specifically for airborne use. As a result, ECI gets chosen to work on the critical programs and you get to grapple with important problems that demand creative solutions.
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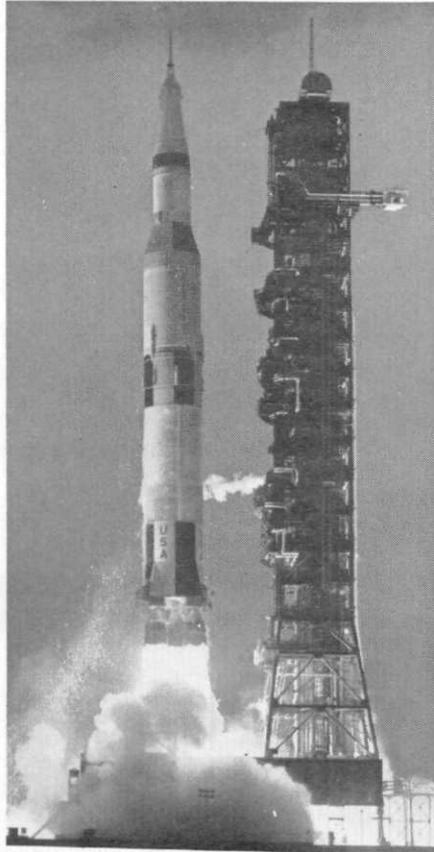
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VOLUME 22

NUMBER 2

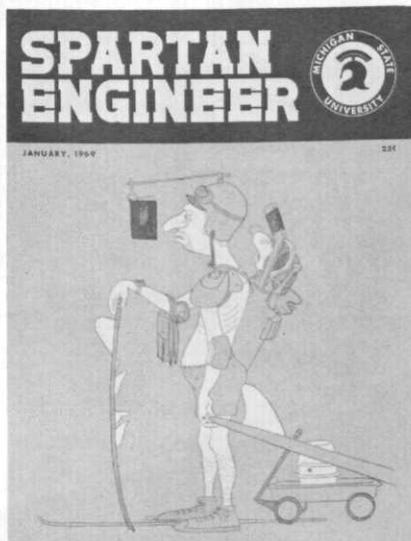
JANUARY, 1969

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The well-rounded engineer is a blend of many interests. This month's cover by Davis Chase shows the "Composite Engineer".

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Engineers, Mathematicians: At NSA, our successes depend on yours.

Because of the nature and scope of the National Security Agency's mission, our successes are in direct relation to your achievements.

At NSA, we are responsible for designing and developing secure/invulnerable communications and EDP systems to transmit, receive and analyze much of our nation's most vital information. The advancing technologies applied in this work are such that they will frequently take you beyond the known and accepted boundaries of knowledge. Consequently, your imagination and resourcefulness are essential qualifications for success.

The Career Scene at NSA

ENGINEERS will find work which is performed nowhere else . . . devices and systems are constantly being developed which are in advance of any outside the Agency. As an Agency engineer, you will carry out research, design, development, testing and evaluation of sophisticated, large-scale cryptocommunications and EDP

systems. You may also participate in related studies of electromagnetic propagation, upper atmosphere phenomena, and solid state devices using the latest equipment for advanced research within NSA's fully instrumented laboratories.

MATHEMATICIANS define, formulate and solve complex communications-related problems. Statistical mathematics, matrix algebra, and combinatorial analysis are but a few of the tools applied by Agency mathematicians. Opportunities for contributions in computer sciences and theoretical research are also offered.

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NSA's liberal graduate study program permits you to pursue two semesters of full-time graduate study at full salary. Nearly all academic costs are borne by NSA, whose proximity to seven universities is an additional asset.

Starting salaries, depending on education and experience, range from \$8845.00 to \$15,000.00, and increases

will follow systematically as you assume additional responsibility. Further, you will enjoy the varied career benefits and other advantages of Federal employment without the necessity of Civil Service certification.

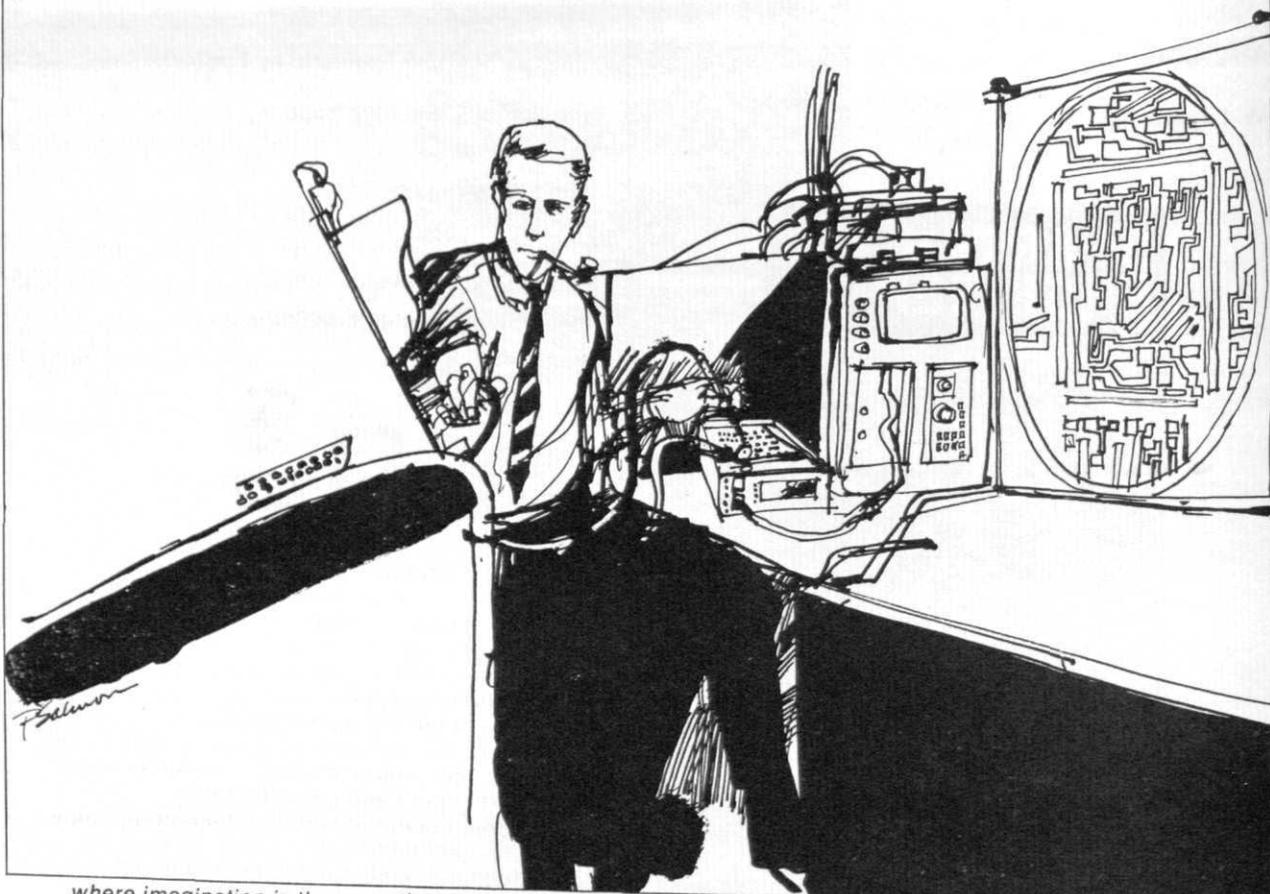
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Campus Interview Dates:

February 5-7, 1969



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... where imagination is the essential qualification

editorial

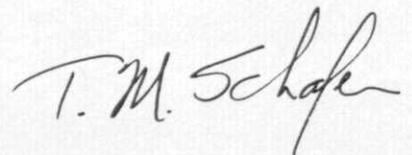
Tell me in one word who is going to solve the problems which are going to have to be solved if Man is to survive on this planet. No, silver-tongued-social-scientist is not one word. But YOU is. Air pollution, water pollution, inadequate housing, lack of mass transportation, refuse disposal and the lack of a good five cent cigar are not problems which are solvable by talk. Solutions are possible (and they had better be if we are ever to be great-grandparents) only by people with the skill to design, manufacture and market the products which will cure the above-mentioned problems and those which have yet to rear their ugly heads. Many of these skills don't even exist today, which is to say that you shouldn't expect to learn them in school. But without the principles, techniques and foundations of specific knowledge which are now offered to engineering students, you will NEVER have the skills absolutely necessary if Man is to survive past the first half of the Twenty-First Century. At this point I could move off tangentially into a diatribe against those who regard an engineering education as the shortest path between high school and an \$850/month job, period. But hindsight shows that people with this attitude rarely make it through to a B.S. anyway. Bet you're glad I didn't get sidetracked, aren't you?

One implication of the above paragraph is that it is products which will enable Man to survive. This was meant to be. Air pollution cannot be stopped

by just legislating the internal combustion engined automobile out of existence, for example. Other means of getting from A to B must be devised instead—and that means new products. A law requiring everyone to ride a bus to work would certainly end the bumper to bumper car traffic on our highways. Instead we would have bumper to bumper buses. Other means of getting from A to B must be devised—and that means new products. Beginning to get the picture?

The other implication of the first paragraph is that only people with engineering skills are necessary for the survival of Mankind. This was not meant to be. The solution of the problems of social injustice, education, agriculture, public health and the administration of public and private organizations require different sorts of skills than those which the engineering student is being prepared to pursue. But do you think that even these other problems can be solved without the products of engineers' skill?

But still, I have greater fears for my Children's Children than discrimination, poor education, hunger, disease, etc.—like not being able to breathe and not being able to get a drink of water and being up to their armpits in garbage and not being able to get any farther from their twelve square foot living area than their feet will carry them. And you already told me who can do something about it—in one word. □



Engineering and Science at IBM

"The interdisciplinary environment keeps you technologically hot."

"Working in data processing today pretty much means you work in a broad spectrum of technologies," says Nick Donofrio.

An Associate Engineer at IBM, Nick is a 1967 graduate in Electrical Engineering. He's using his technical background to design circuits for computer memory systems.

"Circuit design used to be a narrow job," he says. "Today it can take you into the frontyard of half a dozen different fields. In my job, for example, I consult with systems design engineers, chemists, physicists, metallurgists, and programmers."

Keeping up

The interdisciplinary environment at IBM helps an engineer or scientist keep up to date technologically. As Nick puts it, "You're constantly exposed to what's happening in other fields."

IBM needs technical graduates to work in research, design and development, manufacturing, product test, field engineering, and space and defense projects. We also need technical people in programming and marketing.

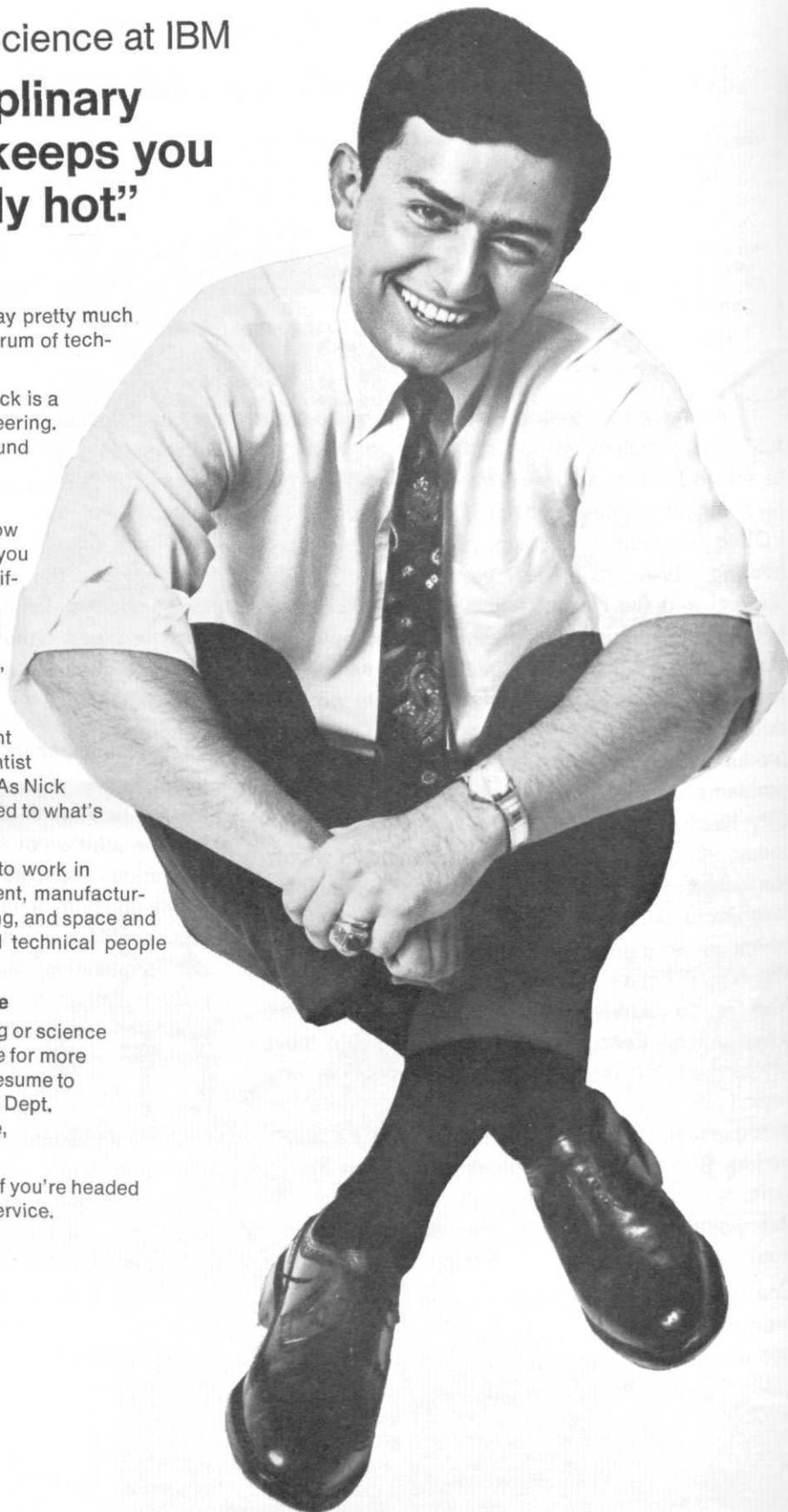
Check with your placement office

If you're interested in engineering or science at IBM, ask your placement office for more information. Or send a letter or resume to Mr. Irv Pfeiffer, IBM Corporation, Dept. CA2020, 100 South Wacker Drive, Chicago, Illinois 60606.

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When engineering is decided upon as a future career by a high school student, very often it is quite difficult to answer the next question, "Where should I obtain my engineering education?" Students select schools for various reasons, few of which make much sense. Perhaps it is where Dad or Uncle Herman went, or a close friend (of the opposite sex) has decided to enroll there, or the sports are the best, etc. However the choice is made, it's one which can be a critical one. Our records are full of engineering students who transfer out of engineering into other curricula because of poor records or dissatisfaction with their studies. Many of these engineering dropouts could have been avoided if the students were mentally prepared for the engineering curricula or if they had chosen the type of curricula designed for their preferences. It is not completely the fault of the student since the type of engineering at the different universities is not adequately advertised by the universities, at least the high school counselors and science advisors are not properly informed. Very often even the students who stick it out have attitudes toward

engineering which resembles the hippie's attitude toward military service. This usually results from the student being unhappy with the type of engineering he is being introduced to; it conflicts with his preconceived ideas of engineering.

Many students have a concept of what engineering is, based on comments and contact with what engineering was. Fifty years ago, or thereabouts, a program which had one term of calculus was considered theoretical; much of the student's time was spent in the classroom and lab learning about how to do things. A course or two in the liberal arts may have been required. We now require 2 or 3 terms of calculus, a course in differential equations and possibly more math. Usually 20% of the course work is in non-engineering areas preparing the engineer to contribute to the solution of problems in a complicated society. The engineering courses have also changed with information which was introduced at the graduate level now being offered to the undergraduate. Less emphasis is given to learning a specialized art and more to obtaining a generalized background. Specialization now occurs in the industry of the student's choice with training programs providing specialized information and techniques. Engineering has changed and the student must be ready to accept this change.

Here at Michigan State University we have a relatively unique program in engineering; one which is highly science and mathematics oriented compared with other universities which offer practically oriented programs with the science and math oriented program (engineering science) an option for advanced students. Actually there is probably a spectrum of engineering curricula in Michigan ranging from MSU at the science end to Western Michigan (they offer a B.S. degree in engineering technology) at the practical end. In between are the other engineering curricula in our

state. The University of Michigan probably offers the strongest classroom competition and Michigan Technological University the most work. Both the prospective high school student and the students already in these programs should recognize existing spectrum of engineering schools. Perhaps a different school should be selected or possibly a transfer or two would be in order!

At MSU, with our emphasis on science and math (we possibly lead the nation in this respect), we are educating engineers to be capable of working on modern problems introduced by the spacecraft, the transistor, the artificial heart, and the five-way stretch girdle. To solve the problem of the heat transfer on the nose of a space capsule was a tremendous problem requiring advanced techniques and skills. It is the solution of these more complicated problems toward which our curriculum is aimed. A grasp of higher level math and the study of science based engineering courses is essential. Our curriculum has a large number of such courses and thus, only the strong math and theory oriented students do well. Because of this background, our students do very well in graduate programs in engineering. (Stanford University accepts our students for graduate work in engineering with a 2.64 average or better.) This is a fact not to be overlooked as graduate work is being required in many industrial positions. Actually, there are no doors closed to the science-oriented student; he may decide on a practically oriented career, and a number of our students do, or graduate study at the best graduate school.

The existence of the diversified engineering programs in Michigan is certainly a credit to the State and provides much opportunity to our young people. We should recognize the contribution of each of the schools and be proud of the excellent program here at MSU. □

engineering at msu

by Professor Merle Potter

Department of
Mechanical Engineering

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offered, and about 2,400 engineers will study there in 1969. It's the most advanced facility of its kind.

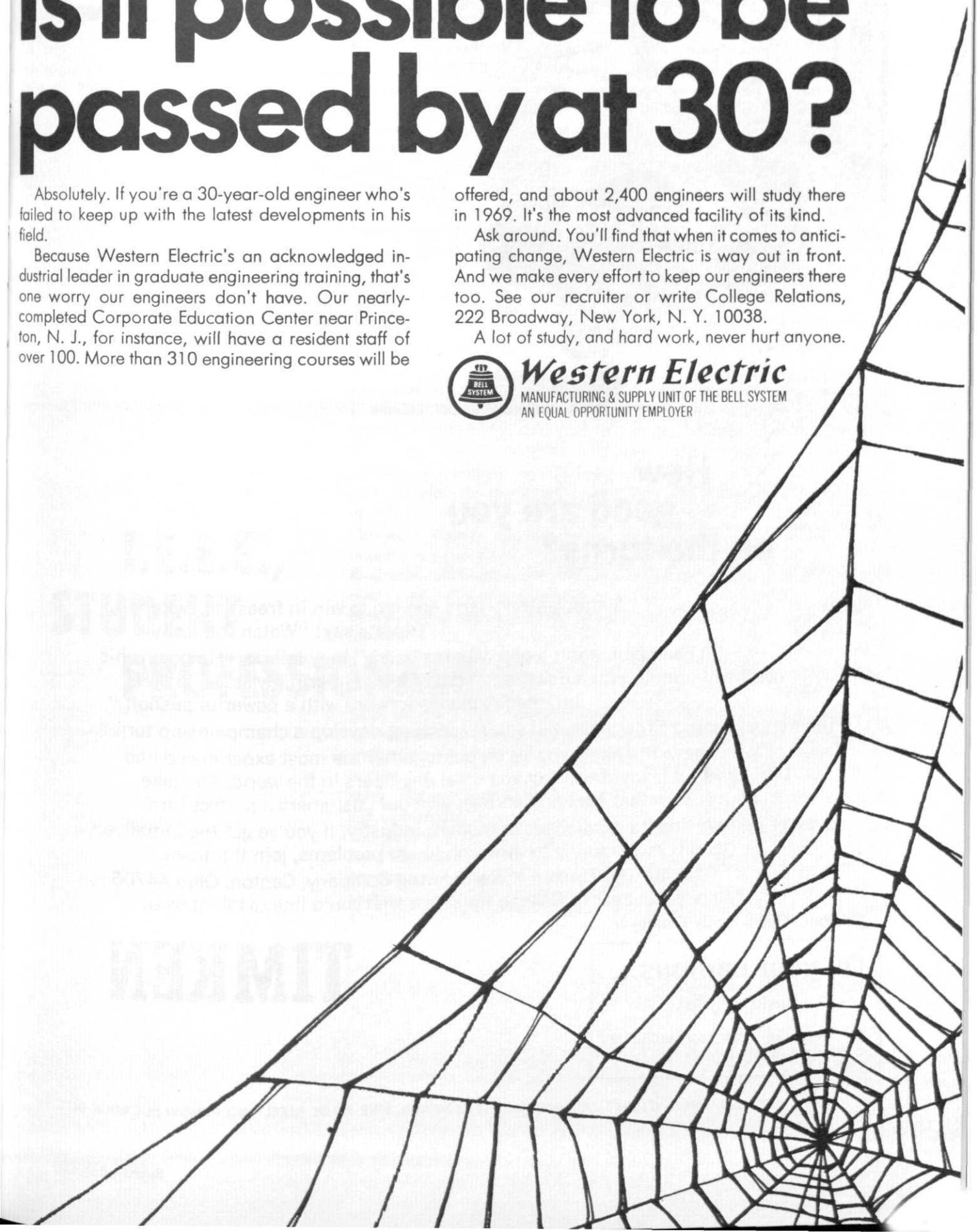
Ask around. You'll find that when it comes to anticipating change, Western Electric is way out in front. And we make every effort to keep our engineers there too. See our recruiter or write College Relations, 222 Broadway, New York, N. Y. 10038.

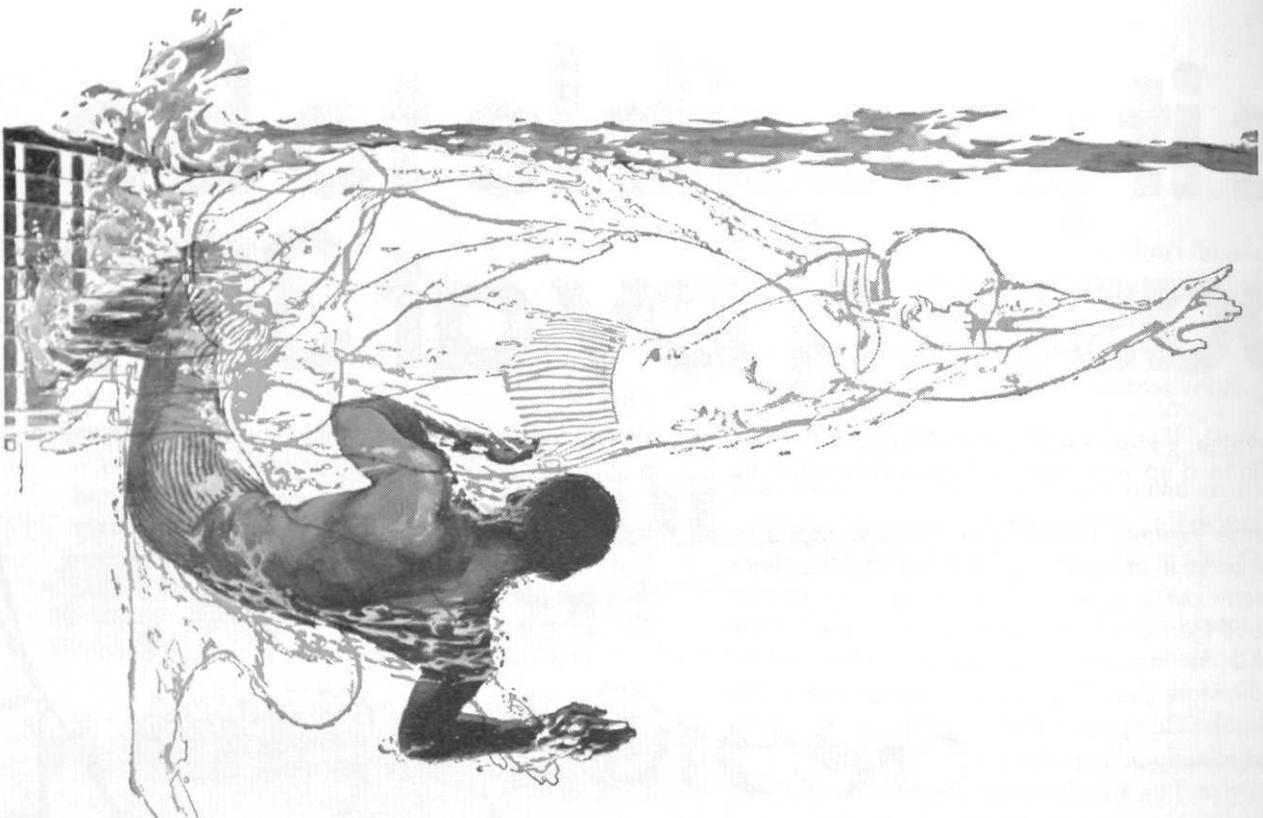
A lot of study, and hard work, never hurt anyone.



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January 30

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I.E.E.E., STUDENT PROFESSIONALISM

by David M. Butler

The Institute of Electrical and Electronic Engineers (IEEE) was founded in 1884 and among the original group of founders were Thomas A. Edison and Alexander Graham Bell. From an initial membership of 25 in 1884, the society has grown to a membership well over 150,000 making it the largest engineering society in the world.

Student Branches of I.E.E.E. have been formed at virtually all major engineering schools. Student Branch membership can provide a meaningful supplement to activities in the classroom as well as entitle members to receive the publications of I.E.E.E. which include 39 technical journals, at a reduced rate. These publications provide an opportunity to see some of the "real world" problems that currently face engineers. It is through such journals that an engineer keeps up with the rapid advances in his field.

The local Student Branch activities included an annual trip to the National Electronics Conference, and meetings twice a term. For their meetings they obtain speakers who are top men from industry and the academic world, who

speak on new technical developments, graduate school, career opportunities, and other topics of vital student interest.

Many students (especially freshmen and sophomores) are not certain that they want to be engineers. They really don't know what it means to be an engineer and to them an engineering society can play a vital role. By joining a society such as I.E.E.E., a student

gains valuable insights into what engineers really do. To those students who know they want to be engineers, the Student Branch can develop more professional attitudes through participation in the activities offered.

The Student Branch is also used to promote the interests of the student in college. It is very instrumental in voicing student opinion on curriculum, textbooks, and professional evaluation. This group can reflect and relay to the proper channels student opinions of relevant issues. One way to become involved in the society is through one of the committees or serving as an officer. Juniors are encouraged in the fall to contact the present officers and express an interest in becoming an officer. They will work on such things as Publicity or Membership Committees. They will also attend some of the meetings of the Executive Committee to gain insights into the structure of the Student Branch.

There are many such societies like I.E.E.E. for all majors of engineering and all students would be wise to investigate the advantages and opportunities open to them through active membership in these organizations. A society can be successful only if it has an active membership and provides its members with worthwhile programs and services. The members must take an interest in the society and also make known their opinions about the programs and performances of the group. This is the best way to help the officers make the society conform to the needs of the members, and be as effective an organization as intended. □

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Some current fields of interest include:

DESIGN ENGINEERING

Openings exist for Electronic and Mechanical Design Engineers in the development of Trainers & Simulators and in the design of checkout and test equipment for large missile and aerospace systems. These responsible positions require interest and/or experience in such design areas as: analog circuits, digital logic, switch/relay logic, electro-mechanical packaging, infrared testing, inertial guidance and Command/Control systems.

Responsibilities will include all phases of design and development from concept to final fabrication and evaluation. M.S. or Bachelor's degree is required in E.E., M.E. or Physics.

FIELD ENGINEERING

The Field Engineer's job ranges from complete contractor maintenance of electronic systems to technical assistance. His primary function is to assist

the customer at operational sites. Responsibilities include: providing maintenance, operational and technical assistance; formal and informal on-the-job training; logistic assistance and the investigation and solution of equipment problems experienced in the field. Requires a Bachelor's degree in E.E. or Physics. Experience with military fire control, radar or communications systems is desirable but not mandatory.

MAINTAINABILITY ENGINEERING

During design phase, positions involve analysis of the feasibility of built-in, self-test features, application of automatic checkout equipment, standardization of circuitry design, minimization of adjustment and alignment requirements and packaging of the product. During system development, assignments will involve production of a complete set of integrated logistics support documents for use as planning guides. Requires B.S. degree in E.E. or Physics.

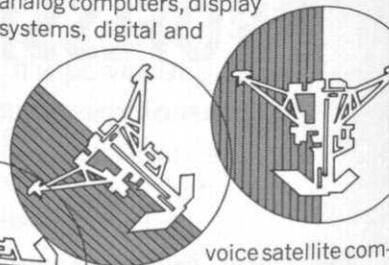
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Specialists in printed communications convert complex engineering data into simple, accurate, illustrated support publications, including technical manuals, orders, brochures, sales proposals, etc. Fields of interest include: digital/analog computers, display systems, digital and



voice satellite communications systems... and many others. Requires a B.S. degree in E.E. or Physics.

CAMPUS INTERVIEWS

February 18

For additional information on the career opportunities available at Hughes Aircraft Company—and to arrange a personal interview with our Technical Staff representatives please contact your College Placement Office or write: Mr. R. J. Waldron, Hughes Aircraft Company, P.O. Box 90515, Los Angeles, Calif. 90009.

AN EQUAL OPPORTUNITY EMPLOYER-M/F
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How to keep a cow's mind on milk. Instead of flies.

An informal report on a few current projects at Shell. Some of them might seem like offbeat work for an oil company. But this is a company that contributes broadly and significantly to society. A company of experts that brings out the best in its engineering, scientific and business people.



Shell scientists have come up with a vast improvement over even the most talented cow tail. It's called VAPONA® insecticide. A plastic strip impregnated with it will kill flies in a cow stall for up to three months. And VAPONA® insecticide combined with CIODRIN® insecticide keeps cows fly-free 24 hours a day—even out in pasture. Give you ideas for further applications?

Energy from under the sea

Shell is heading into ever-deeper water in the search for oil and natural gas. Recently we designed and installed permanent drilling/production platforms as tall as a 34-story building, with



still bigger structures in the works. And we are operating in considerably deeper water from floating platforms. We are also searching on land in 16 states to help meet burgeoning energy needs.

Digestible detergents



The main trouble with detergents is they don't go away. They pollute streams, make fresh water foamy. The solution: detergent compounds that organisms can consume. These "biodegradables" clean clothes just as effectively, but keep streams free of detergent foam. Elsewhere in the chemical part of our business, Shell research has resulted in a wealth of plastics for home and industry, and fertilizers to alleviate food shortages.

The name of the game

More gasoline per barrel of crude oil delights engineers, scientists and conservationists alike. Our new hydrocrackers actually produce *more* than a gal-



lon of refined product from a gallon of feed stock. And we are using sophisticated techniques to tailor-make products by reassembling hydrocarbon molecules.

The pursuit of excellence leads Shell into a variety of fields, both on and off the beaten track for an oil company. If you have a more-than-one-track mind, a desire to explore, to pit your skills against many kinds of problems, there could be a place for you in Shell.

Perhaps your training in engineering, science or business can contribute to tomorrow's new developments. For information about openings throughout Shell sign up at the placement office for an interview with our representative. Or write to Q. C. Stanberry, Recruitment Representative, Dept. E, The Shell Companies, Box 2099, Houston, Texas 77001.

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Student Organizations

Editor's Note:

Professional organizations provide the student with an opportunity to gain insights into his chosen field at a time when he still has the most options open to him. Descriptions of the student branches of professional organizations and the activities of these student branches will be a continuing feature of the Spartan Engineer.

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

The SAE is the national technical society of those engaged in research, development, production, and operation of ground, air, and space vehicles, their fuels and lubricants. SAE cuts across practically every engineering discipline, and is a major coordinating agency between the many specialized engineering fields involving engineers and scientists who pool their knowledge to constantly improve vehicles for civilian and governmental consumption.

Activities of the MSU Student Branch include the election of officers, invitation to speakers, the showing of movies, and participation in plant tours, in much the same manner as do the parent Society Sections. Student SAE members are invited to attend the regular meetings of the Mid-Michigan Section, and the Annual Meeting of the Society held in Detroit.

TRIANGLE FRATERNITY

Triangle is a social professional fraternity for engineers and scientists who are interested in "Brotherhood" and a well-balanced education. Its membership is made up of engineering, chemistry, physics and math majors desiring all of the benefits of a social fraternity along with the many benefits of the engineering profession—present and future.

The purposes of Triangle are varied and cover both the student and the graduate. However, the purpose of interest to you, is that it provides an environment conducive to a well-rounded education. Along with the Greek activities, Triangle participates in all University functions plus engineering activities. It's a fraternity of fun, scholarship, and "Brotherhood".

To become a Triangle member, one must go through the I.F.C. (Inter-Fraternity Council) rush program and if pledged by Triangle, through a period of pledgship. All in all it takes a little over a term to become an active.

ASSOCIATION FOR COMPUTING MACHINERY

The Michigan State University Chapter of the Association for Computing Machinery is a student organization comprising computer science majors, engineering majors and any other students interested in computers.

The student chapter of Association For Computing Machinery holds several meetings each term. Speakers lead discussions considering all phases of computer technology, ranging from computer graphics to time-sharing networks, hardware design, software systems and current developments at the Michigan State University Computer Laboratory. The National Association For Computing Machinery supplies several prominent speakers each year.

Membership is open to any and all interested students at Michigan State. National membership is not a requirement for local membership, but is highly recommended.



Tomorrow, Paul Barr may even get to his desk

Paul Barr is a hard man to catch. He may be at the bench sweating over a prototype circuit . . . or have his head under a car lift surveying the built-in problem. He's got lab people hopping and test drivers in and out of spins. A couple of friction experts shake their heads when they see him coming. But wherever development engineering leads on a sophisticated new braking system, Paul Barr's on his way. And no two Mondays ever start alike. The question is . . . can you say the same? Take a good look at how your career shapes up, compared with Paul's and his colleagues' at Delco. You might even call us collect. Area Code 317/459-2808. Or, write: Mr. C. D. Longshore, Supervisor, Salaried Employment, Dept. 400, Delco Radio Division of General Motors, Kokomo, Indiana.

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Try Xerox and see



An engineer checks out a data collection machine using punched tape to record number and type of operations performed.

You've forgotten the rising long before dawn and the drive along deserted roads. Now the morning is still and crisp; the waist-high weeds are perfect cover. You work through them carefully, quietly, expectantly. Then—the multi-colored explosion of a flushed bird*, beating up in a blur of speed and sound. The over-and-under is at your shoulder by pure reflex... you lead and squeeze...

This is the age-old excitement of the hunt, the instant coordination of mind and muscle against the finely-honed instincts of your game. Engineering offers a kindred excitement, or should. The stalking of ideas, the shooting down of tough and wily technical obstacles, the well-trained engineering mind against the complexities of nature.

But too often today, this excitement is lost in routine and fragmented assignments or a company climate in which engineering is taken for granted. Which is why, if you're hunting for professional excitement, it's worth looking into the opportunities at Xerox. Your degree in Engineering or Science can qualify you for some intriguing openings in fundamental and applied research, engineering, manufacturing and programming.

We're located in suburban Rochester, New York. For details on openings, write directly to Mr. Roger Vander Ploeg, Xerox Corporation, P.O. Box 251, Webster, New York 14580.

*Rochester is in the upper New York State region noted for its fine hunting of all kinds.

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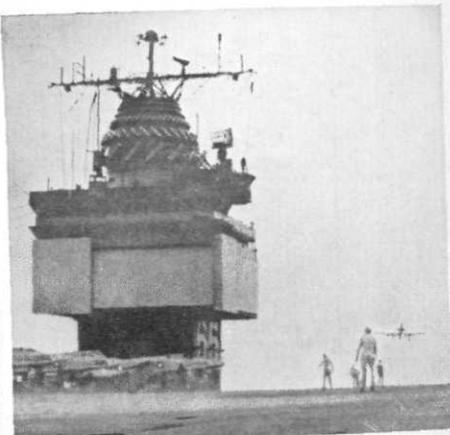
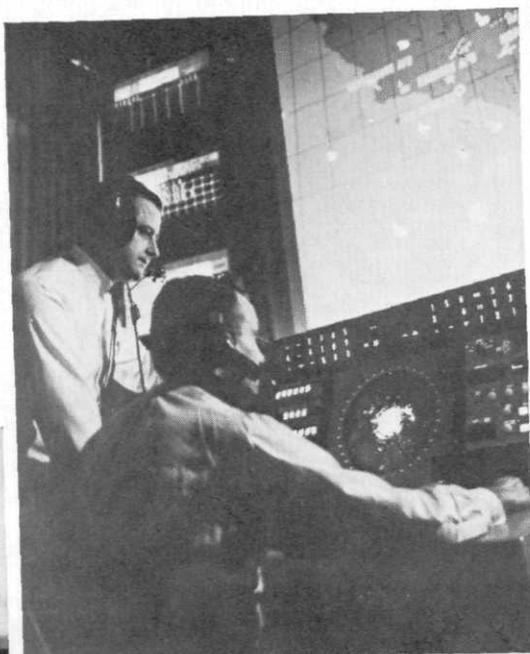


PRODUCT GROUP	LOCATIONS HAVING CURRENT OPENINGS	MAJOR PRODUCTS PRODUCED	DISCIPLINE REQUIREMENTS	TYPE OF WORK PERFORMED
CHEMICALS —Inorganic —Organic & Specialty —Agricultural	Augusta, Ga. Brandenburg, Ky. Charleston, Tenn. Joliet, Ill. Lake Charles, La. Little Rock, Ark. McIntosh, Ala. New Haven, Conn. Niagara Falls, N.Y. Pasadena, Texas Rochester, N.Y. Saltville, Va.	Chlor-Alkali Products Ammonia Phosphates Urea Nitrogen Acids Hydrazine Petrochemicals Insecticides Pesticides Polyurethane Carbon Dioxide Animal Health Products Automotive Chemicals Other derivatives	ChE ME IE Chemistry Accounting Business Adm. Transportation Marketing	Process Development, Design, Maintenance, Planning, Scheduling, Production, Sales, Accounting, Marketing, Financial Analysis, Distribution, Project Engineering (Plant Startup & Construction), Research Engineering, Technical Service
METALS —Aluminum —Brass —Ormet, Corp.	Burnside, La. Chattanooga, Tenn. Gulfport, Miss. Hannibal, Ohio East Alton, Ill. New Haven, Conn. Sedalia, Mo.	Alumina Aluminum Aluminum Extrusions Aluminum Sheet, Plate, Coils Brass Fabricated Parts Sheet & Strip — Brass Roll Bond Wire & Cable	ChE IE ME Metallurgy Met. Engineering Accounting Business Adm. Ind. Tech. Ind. Mgmt.	Manufacturing Production Sales Maintenance Finance Metals R&D
FOREST PRODS, PAPER & FILM —Olinkraft, Inc. —Ecusta —Film	West Monroe, La. Pisgah Forest, N.C. Covington, Indiana	Carbonizing Paper Fine Printing Papers Specialty Paper Products Cigarette Paper & Filters Cellophane Kraft Bags Kraft Paper Kraftboard Cartons Corrugated Containers Olinkraft Lumber	ChE Chemistry Pulp & Paper Tech. IE ME Mathematics Business Adm. Accounting	Marketing Process Engineering Plant Engineering Research & Dev. Statistician Systems Engineering Production Management General IE Design and Development Accounting
WINCHESTER-WESTERN	East Alton, Ill. New Haven, Conn. Marion, Ill. Kingsbury, Ind.	Sporting Arms Ammunition Powder Actuated tools Smokeless Ball Powders Solid Propellants Safety Flares Franchised Clubs	Ind. Tech. IE ME Mathematics ChE Accounting Business Adm. Marketing Personnel Mgt. Physics Ind. Mgmt.	Production Control Purchasing Manufacturing Plant Engineering Sales Financial Analysis Personnel Marketing R&D

If you find this chart interesting,
we're interested.

For additional information about Olin,
please contact your Placement Office or write Mr. Monte H. Jacoby, College Relations Officer,
Olin, 460 Park Avenue, New York, N.Y. 10022. Olin is a Plan for Progress company and an equal opportunity employer (M & F).

Hughes announces new openings on the TECHNICAL STAFF.



Assignments exist for Engineers graduating in 1969 with B.S., M.S. and Ph.D degrees in ELECTRICAL ENGINEERING.

HUGHES-FULLERTON Engineering Laboratories assignments range from research to hardware development and operational support of products and systems in the field. Our current activities involve the advanced technologies of phased-array frequency-scanning radar systems, real-time general purpose computers, displays, data processing, satellite and surface communications systems, surface-to-air missile systems and tactical command/control systems.

For additional information on the opportunities offered at HUGHES-FULLERTON in Southern California — and to arrange for a personal interview with our Staff representatives, please contact your College Placement Office or write: Mr. D. K. Horton, Supervisor, Professional Staffing, HUGHES-FULLERTON, P. O. Box 3310, Fullerton, California 92634.



**On-campus interviews
February 18**



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an engineer



knowledge of the German language is also required since all classes are conducted in German.

After knowing all of the requirements for this scholarship, those who know Charles would say "why him?", a question even Charles might ponder. I've known Charles for over a year, we're brothers of Triangle and even pledged together, and his success is derived from inexhaustible inner energy which requires many outlets. Some of his credits are: he is a National Merit Scholarship winner; a member of Eta Kappa Nu, the national Electrical Engineering honorary; he worked as a science assistant in computer programming at the Manned Spacecraft Center in Houston; and for the past two summers he was a systems analyst for Shell Oil Company.

After one year in Germany, Charles will return to M.S.U. to finish his

in germany

CHARLES B. GARNER

by Art Bell

How does a Michigan State E.E. get to spend his senior year studying in Germany? Well, when you are Charles Garner, it's a matter of outstanding qualifications and a gentle push from an academic advisor. Charles is this year's winner of the John F. Kennedy Memorial Scholarship, which allows him a year of study at an engineering school in West Berlin. He was chosen by the National Union of Engineering Students, composed from students of five West German engineering schools, from a field of students interviewed throughout the United States. The scholarship provides for transportation, tuition and fees, as well as a monthly stipend.

The general qualifications for the scholarship are that the recipient have some practical work experience in his field and have completed his third or fourth year in an American engineering curriculum. A working

senior year. I urge anyone who is interested in teaching techniques, class comparisons, or just friendly correspondence, to write to Charles and show him that M.S.U. engineers are behind him all the way. His address is:

Charles B. Garner, Jr.
c/o Walter Mayheim
1 Berlin 65
Lynar St.— 5-6
Berlin, Germany

Charles' reflections on M.S.U. and the country are a credit to his high ambitions and the impression he makes on the many engineering students of Germany, will do a lot to show other countries what American engineering students are made of. Add up previous experiences, future goals, and a strong will to learn and there is no doubt why Charles Garner is one of our country's leading engineering students. □

Isotropic* steel for improved performance

Isotropy is what the designer of this highly-stressed 335-pound tractor yoke had in mind when he specified *cast-steel*.

Not taken in by the shopworn "fiber" or "flow line" argument, he knew that road-building equipment is subjected to shock loads of high magnitude—in several different directions—so that he could not gamble with a construction where toughness, impact and fatigue properties are not uniform in all directions.

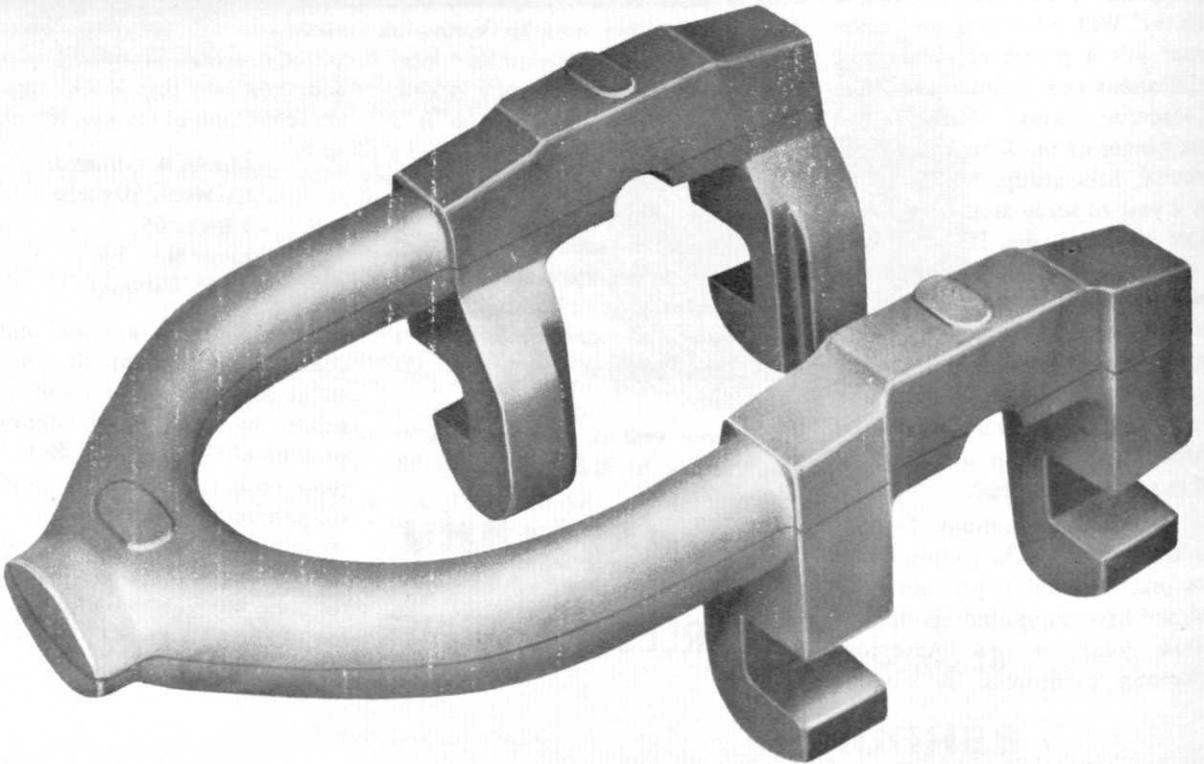
Cast-steel also allowed the designer of this tractor yoke plenty of engineering flexibility . . . He didn't have to worry about fitting

together cumbersome wrought shapes, and he could put metal precisely where he wanted it for load-carrying ability, to avoid possible areas of stress concentration . . . And he could choose the steel composition which would give him optimum strength/cost ratio.

Want to know more about *cast-steel*? We're offering individual students free subscriptions to our publication "CASTEEL" . . . Clubs and other groups can obtain our sound film "Engineering Flexibility." Write Steel Founders' Society of America, Westview Towers, 21010 Center Ridge Road, Rocky River, Ohio 44116.

*Isotropic: Equal properties in all directions.

STEEL FOUNDERS' SOCIETY OF AMERICA



***Cast-Steel
for Engineering Flexibility***

Tau Beta Pi

T B Π

When Phi Beta Kappa, the oldest Greek-letter honor society, was founded in 1776, all colleges were for the training of men in the service of the "church and the state". By the late 1880's however, education had expanded into many new fields, and Phi Beta Kappa elected to restrict its membership to the liberal arts. In 1885 Professor Edward H. Williams, Jr., head of the Mining Department at Lehigh University, determined to offer technical men as good a chance of recognition for superior scholarship in their field as that afforded by Phi Beta Kappa in the liberal arts. Tau Beta Pi

National Engineering Honor Society

was founded "to mark in a fitting manner those who have conferred honor upon their Alma Mater by distinguished scholarship and exemplary character as undergraduates in engineering, or by their attainments

as alumni in the field of engineering, and to foster a spirit of liberal culture in the engineering colleges of America."

The second chapter of Tau Beta Pi was organized at Michigan State College in 1892. We of Michigan Alpha are proud to be members of a chapter which last year celebrated its 75th anniversary.

From these beginnings, Tau Beta Pi has grown to be a vital force in the engineering world, with collegiate chapters at 133 institutions, as well as numerous alumni chapters, and a total initiated membership of nearly 150,000. Over fifty professors of the MSU College of Engineering are Tau Beta Pi members, including the dean of the college and six department chairmen.

Tau Beta Pi is an honor society, not a service organization, but the honor conferred by election to membership carries with it a corresponding responsibility. Since Tau Beta Pi is the only student organization that represents students from all departments within the College of Engineering, the society is especially interested in projects that concern the entire college.

Nationally, Tau Beta Pi's major projects are graduate fellowship awards, student loans, and non-technical essay awards. Tau Beta Pi fellowships totaling over \$280,000 have been granted to 228 members needing financial aid for graduate education. Any member may apply for a fellowship grant, and recipients are free to do advanced work at any institution in any field which will enable them to contribute to the engineering profession. The resources of Tau Beta Pi's loan fund are available to members who otherwise would be

by Wes Patterson

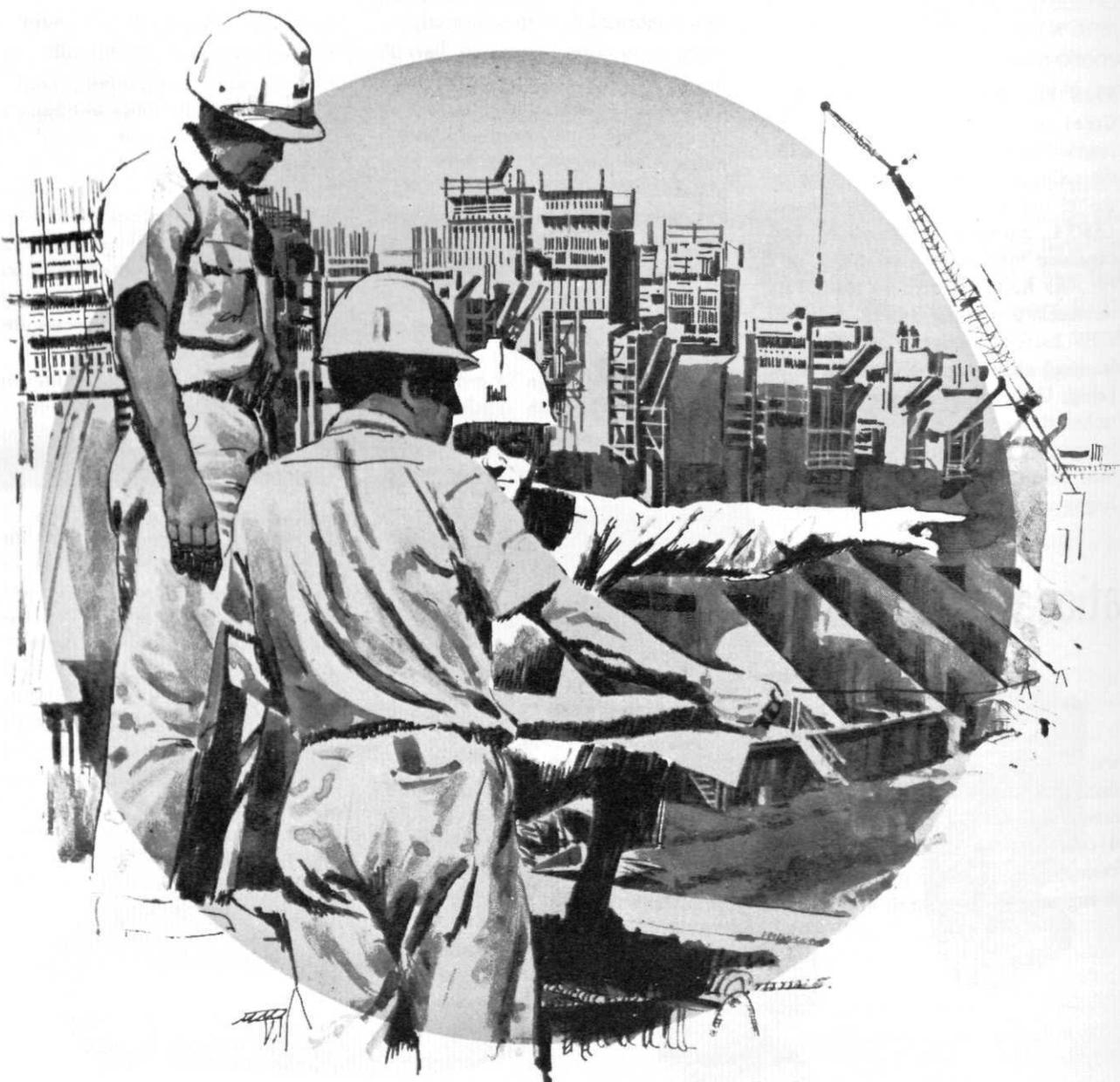
without sufficient money to remain in college. Each student elected to membership is required to write an essay, preferably on a non-technical subject, the best paper from each chapter is entered in national competition, the winners of which are awarded cash prizes. In addition, the winning essays are published in the organization's quarterly magazine.

Tau Beta Pi is primarily a *student* organization. The honor conferred by election to membership is significant because of the society's high eligibility standards, because it comes from the students themselves, and because of the world-wide reputation of the society. Tau Beta Pi's position of respect in the engineering profession has been earned because it has continued to be guided by the high purposes for which it was founded. Though not all students can become members of Tau Beta Pi, the society's ideals of excellence in scholarship and character and its *emphasis on liberal education* are the attributes of any true professional. Every student engineer will be a better person for making them his own. □

The Corps of Engineers is also the most professional, and the most active engineering/construction group. For the engineer who wants to be where the action is, the opportunities to take part in new, more advanced, extremely challenging engineering/construction projects will be virtually limitless. The Corps' activities today include the broadest sweep of professional demands — water resources development, huge

dam construction, navigation and flood control projects, construction of hospitals, family housing, manufacturing plants, missile sites—you name it! This is the organization for the engineer who wants to do things, plan things, become involved, grow—starting right now. If you're a doer, and you want to be where the action is, write to us today. We'll tell you all about the advantages of a civilian career with the Corps of Engineers.

Engineers:
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Corps of Engineers: Department of the Army Washington, D.C. 20315



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where do we go from here?

COMMENTS FROM MR. EARL M. KELLY

by Art Bell

icture ourselves as June graduates, a pretty good thought for this time of year isn't it? So we have finally become engineers or at least have a degree that says so, but where do we go from here? My position is to acquaint M.S.U. students with the accomplishments of outstanding graduates who knew where they wanted to go. This issue outlines some of the views of Earl M. Kelly, a 1949 graduate in Electrical Engineering. Mr. Kelly is currently working with the Foxboro Company of Massachusetts as a Vice President, and General Manager of U.S. Operations.

As a manager of a technically-oriented company, Mr. Kelly feels his engineering degree has served him well in the business world. Like most people in a managerial position, he recommends a supplementary degree in Business, both for further educational experiences and faster advancement in industry.

When asked about the direction engineering curricula should take to prepare graduates for business positions, Mr. Kelly answered: "The Engineering College is heading in the right direction by moving towards a more technical program which gives the graduate engineer a better fundamental background to work with. I believe it is the responsibility of the university to teach a man to think and solve various types of problems, then this man stands to contribute more to the industrial world and to personally grow as a direct result of his contributions. It is up to industry to take this man, well grounded in the fundamentals of engineering, and train him in the skills of the industry he chooses. This training is the direct responsibility of industry. If I were going to add to the

education of the graduate engineer who has management aspirations in industry, it would be in the area of business and finance. This is vital to his proposed management career, even if he must pursue this training during the summer or in an extra year of college. Engineers who plan to go into industry should learn to express their ideas and communicate with others. So many fine ideas are lost as a result of the inability on the part of well educated, intelligent engineers to put these ideas across to management."

What are industries' opinions of M.S.U. graduates? I've always wondered how we rate when compared to other engineering school graduates, and Mr. Kelly's reaction to this is an excellent pride booster for our school. Mr. Kelly states, "M.S.U. engineers have a very fine fundamental engineering education, and the Michigan State environment seems to turn out well-adjusted and adaptable engineers. Instead of being on "Cloud Nine", they are practical, down-to-earth guys and seem to fit into a people-oriented company extremely well."

Well men, June is closer than we think and it's not an idle dream to see ourselves behind a lavish desk with more title and salary than a European Lord. M.S.U. graduates have proven themselves in the past and it's up to us to carry on the tradition. Now is the time to both dream and apply ourselves, but most importantly realize what direction we want our education to take. Careers are made, not born.

The *Spartan Engineer* thanks Mr. Kelly for his time and concern over M.S.U. engineering students and their educational needs and concerns. □



Decisions!
Decisions!

Some decisions are relatively unimportant. Where you put your engineering talent to work is not.

As you contemplate one of the most important decisions of your life, we invite you to consider a career at Pratt & Whitney Aircraft. Here, you will find wide-open opportunities for professional growth with a company that enjoys an enviable record of stability in the dynamic atmosphere of aerospace technology.

We select our engineers and scientists carefully. Motivate them well. Give them the equipment and facilities only a leader can provide. Offer them company-paid, graduate-education opportunities. Encourage them to push into fields that have not been explored before. Keep them reaching for a little bit more responsibility than they can manage. Reward them well when they **do** manage it.

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- COMPUTER SCIENCE • ENGINEERING SCIENCE • ENGINEERING MECHANICS.

Consult your college placement officer—or write Mr. William L. Stoner, Engineering Department, Pratt & Whitney Aircraft, East Hartford, Connecticut 06108.



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transfer students...

Transfer students make up more than 30 per cent of the graduates each year in Engineering at Michigan State University. Figures released recently by the Student Affairs Office of MSU's College of Engineering show an interesting distribution of students from the various Junior and Community Colleges in Michigan.

From the Fall term of 1964 through the Fall term of 1968, the largest numbers of transfer students were from Flint Community Junior College, Lansing Community College and Muskegon Community College. Total figures for that period are shown in the table below. □

....in engineering



Schools

Number of transfer students Fall 1964 through Fall 1968

Alpena Community College	5
Bay de Noc Community College	2
Delta College	32
Flint Community Junior College	54
Grand Rapids Junior College	20
Henry Ford Community College	6
Highland Park College	5
Jackson Community College	25
Kellogg Community College	25
Lake Michigan College	13
Lansing Community College	53
Macomb County Community College	5
Muskegon County Community College	37
Northwestern Michigan College	8
Oakland Community College	5
Schoolcraft College	1
Southwestern Michigan College	1
St. Clair Community College	12

The stormy weather of matter intrigues the mind at RCA.

The broad sweep of electronics at RCA involves the meteorology of matter. Here, this turbulent atmosphere of the solid state is explored by crystallographers, microscopists, spectroscopists, engineers, physicists and other seasoned professionals.

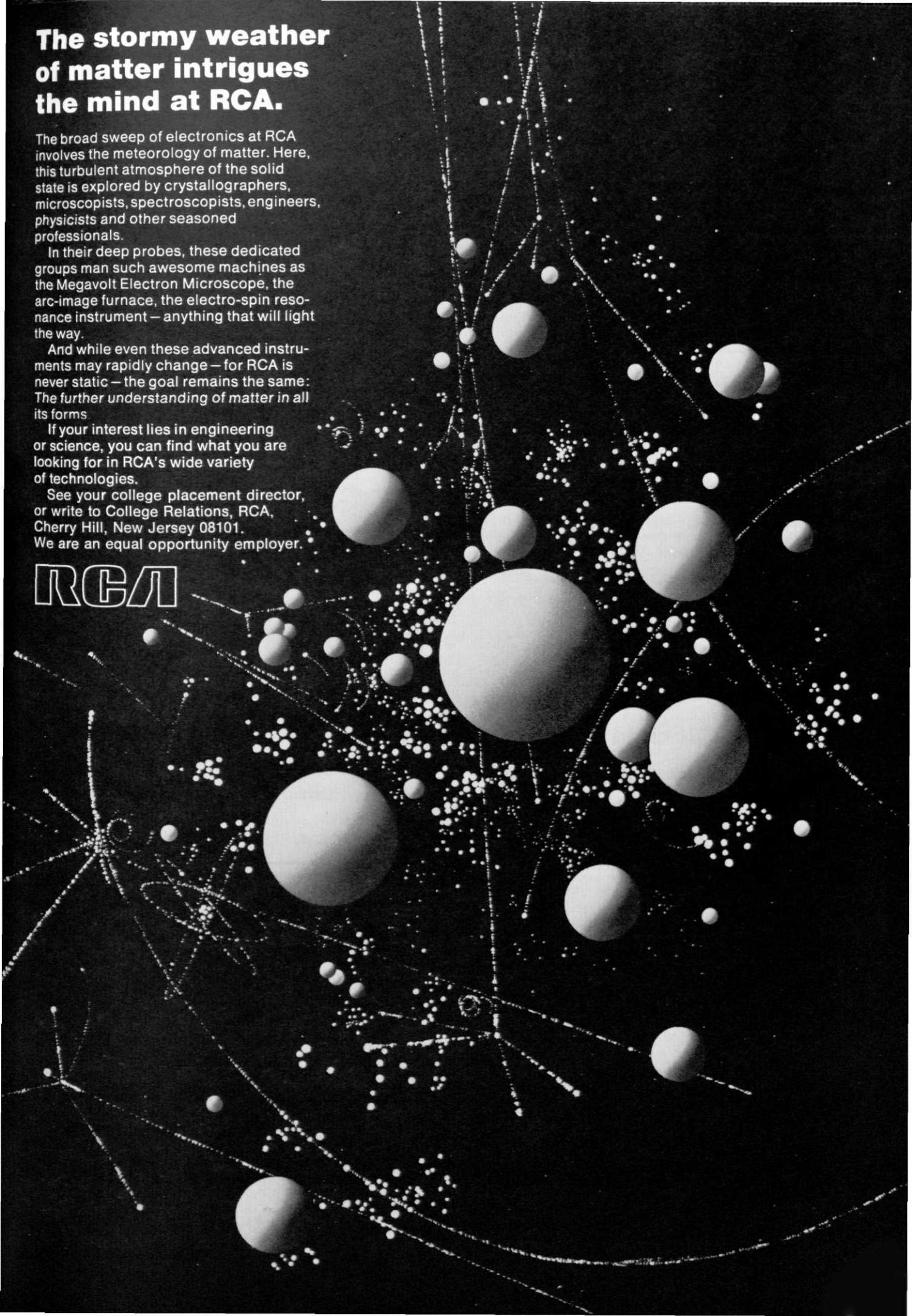
In their deep probes, these dedicated groups man such awesome machines as the Megavolt Electron Microscope, the arc-image furnace, the electro-spin resonance instrument — anything that will light the way.

And while even these advanced instruments may rapidly change — for RCA is never static — the goal remains the same: *The further understanding of matter in all its forms.*

If your interest lies in engineering or science, you can find what you are looking for in RCA's wide variety of technologies.

See your college placement director, or write to College Relations, RCA, Cherry Hill, New Jersey 08101. We are an equal opportunity employer.

RCA



Summary of Majors Requested by Employers

*From information published
By the Placement Bureau*

College	Number of Graduates	Requests	Jobs Available Per Graduate
Agriculture	226	340	1.50
Arts and Letters	471	174	0.37
Business	468	1737	3.71
Communication Arts	148	248	1.68
Education	607	4146	6.83
Engineering	199	2448	12.42
Home Economics	154	51	0.33
Natural Science	425	1182	2.79
Social Science	564	442	7.85
Veterinary Medicine	76	14	0.18

BREAKDOWN WITHIN THE ENGINEERING COLLEGE

Major	Number of Graduates	Requests	Jobs Available Per Graduate
Applied Mechanics	2	7	3.50
Agriculture	14	61	4.36
Chemical	20	440	22.00
Civil	23	289	12.55
Electrical	73	602	8.25
Mechanical	57	753	13.21
Metallurgical	10	211	21.10

“I don't want to wait for someone to die or retire in order to get promoted.”

We're with you.

Because at IH we believe a promotion is something you earn. Not some kind of hand-me-down just to fill an empty slot.

That's why you'll have to be a thinker. A doer. An innovator. The kind of guy who prefers to be promoted on his merits alone.

You'll need talent. Lots of imagination. And plenty of guts. The guts to make decisions and fight for your ideas.

We, in turn, will give you plenty of freedom —and excitement, too.

So you'll learn a lot. (Maybe even teach us a thing or two.)

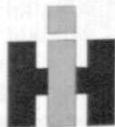
What's more, if you join us, you'll be part of a diversified company. One where there's plenty of action in farm equipment, motor trucks, construction and steelmaking.

And you'll also find we're banking heavily on research. (We've got some pretty far-out ideas on computers in trucks, laser beam construction equipment, applications of solar energy and nuclear power.)

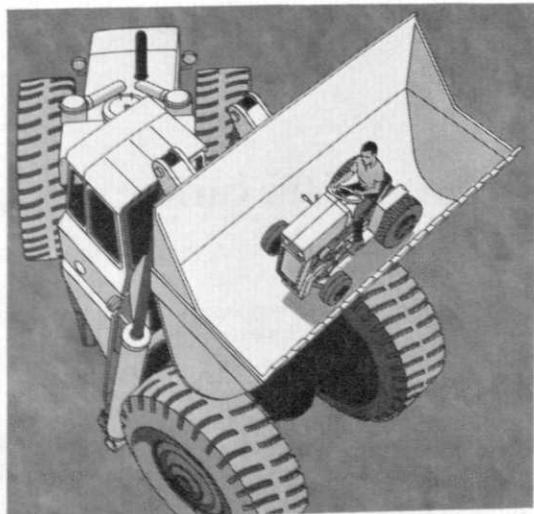
As a result, we're looking for test, design, manufacturing and research engineers. We need accountants and production management people. And we need sales people for our wholesale and retail operations.

So talk to your campus placement officer about us. He'll fill you in on the jobs we want to fill.

With minds, not bodies.



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IH Cub Cadet® sits in bucket of Hough PAY® loader with a lift capacity of 90,000 pounds.

Do you think a bright young engineer should spend his most imaginative years on the same assignment?

Neither do we.

That's why we have a two-year Rotation Program for graduating engineers who would prefer to explore several technical areas. And that's why many of our areas are organized by function—rather than by project.

At Hughes, you might work on spacecraft, communications satellites and/or tactical missiles during your first two years.

All you need is an EE, ME or Physics degree and talent.



If you qualify, we'll arrange for you to work on several different assignments...and *you* can help pick them.

You may select specialized jobs, or broad systems-type jobs. Or you can choose not to change assignments if you'd rather develop in-depth skills in one area.

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It means you'll become more versatile in a shorter time.

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Space Systems Engineers
Missile Systems Engineers
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For additional information, please contact your College Placement Director or write:

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Hughes Aerospace Divisions
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CAMPUS INTERVIEWS

February 18

Contact College Placement
Office to arrange interview
appointment.



Practice safety and live longer—all help will be needed to pay off the interest on the national debt.

□ □ □

Contentment has one big advantage over having a lot of money; friends don't try to borrow it from you.

□ □ □

A farmer's barn burned down and the agent for the insurance company explaining the policy that covered the structure, told him that his firm would build another barn of similar size instead of paying the claim in cash.

The farmer was furious, "If that's the way your company does business," "you can cancel the insurance on my wife!"

□ □ □

A bureaucratic government is distinguished by two bad habits—living beyond its income and taxing its people beyond theirs.

□ □ □

A man picks a wife about the same way an apple picks a farmer.

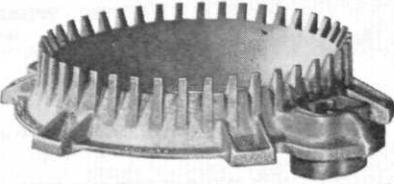
FREEDOM OF SHAPE...

One of the outstanding advantages of Malleable Iron Castings

Casting is the simplest and most direct way of creating form and shape with metal. Casting offers almost unlimited freedom to the designer. A cast design is not restricted by sizes or shapes of mill stock, accessibility of tools, withdrawal allowances for dies, or other limitations. Complex shapes, interior cavities, and streamlined contours, which would be difficult or impossible to create with other methods, are simple with a casting.

For instance, consider the complexity of creating the dozens of teeth, lugs, holes and collars on this pipe repair clamp. It

would be prohibitively expensive to produce by any method other than casting. By using the casting process for economy,

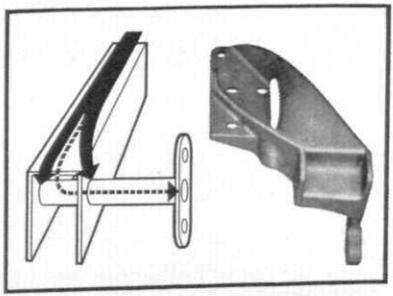


and Malleable iron for strength and ductility, these clamps combine service and value.

The design freedom made possible by

casting also helps to make parts stronger. Metal components tolerate loads better if they are designed to distribute stresses efficiently. Sharp corners or other abrupt sectional changes tend to restrict the uniform distribution of these stresses. The corner thus becomes a logical site of fatigue failure. In a casting, it is a simple matter to round out corners, blend sections and taper connecting members to achieve a design which will distribute stresses.

The illustration shows how stresses "set up" at sharp corners. A much smoother transfer of stresses was achieved when this part was switched to a Malleable casting (shown on the right).



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Our leadership in the aerospace industry is supported by a balanced combination of military and commercial programs, a factor to consider in plan-

ning your future career. Openings now exist in many of our more than 39 locations throughout the U.S.

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or: Mr. L. P. Kilgore, Professional Employment, 3000 Ocean Park Blvd., Santa Monica, Calif. 90406.

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Home address _____

City & State _____ Zip Code _____ Phone _____

College or University _____

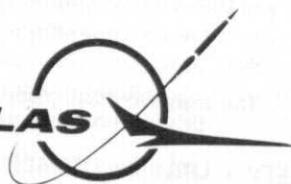
Degree: BS _____ MS _____ PhD _____ Major Field _____
(date) (date) (date)

Graduation date _____

Area Choice: East Midwest West Best Opportunity

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HIGH SCHOOL ENGINEERING INSTITUTE - June 15-28, 1969

INSTITUTE PROGRAM

Under the direction of the College of Engineering and the Continuing Education Service, Michigan State University will offer, during the coming Summer, a special introduction-to-engineering program for high school students who have completed the 10th grade. This HIGH SCHOOL ENGINEERING INSTITUTE has been designed to encourage and challenge young men and women in the fields of those sciences which serve as foundations for engineering applications. The course work has been organized to stimulate the kind of learning experiences which will lead to greater understanding of the work done by engineers in our modern world. The total program has been designed to run two weeks, from June 15 through noon on June 28, 1969.

ELIGIBILITY

Up to 140 students will be selected to attend the HIGH SCHOOL ENGINEERING INSTITUTE. To be eligible, students must:

1. be matriculants of accredited high schools in Michigan or nearby states.
2. be in the upper 25% of their high school classes as of the last reporting period.
3. have completed the 10th grade by June, 1969, but not the 12th.
4. have completed two years of work in high school mathematics by June, 1969.

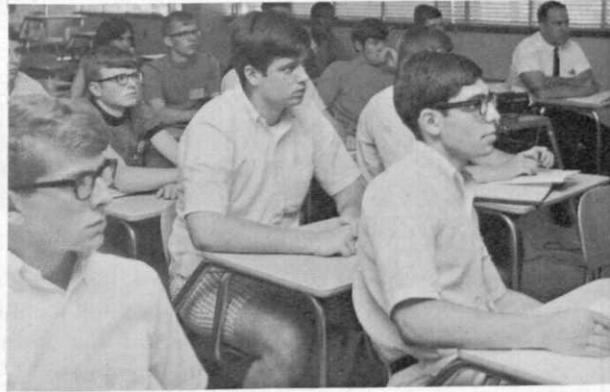
INSTRUCTION

The ENGINEERING INSTITUTE will offer formal courses of study and lectures in the fields of several major disciplines: bioengineering, chemical engineering, civil engineering, computer programming, electrical engineering, engineering sciences, mathematics, mechanical engineering, metallurgy and physics. The instructional staff has been selected from faculty members of Michigan State University.

A special phase of the program will be an individual computer project. This project will include programming and actual running of the problems through the CDC 6500 Computer System.

COST OF THE PROGRAM

The program costs \$140 per participant. This amount covers instructional costs, textbooks, laboratory supplies, notebooks, room and board. The student will provide his transportation to the campus, pencils and spending money. A \$20 deposit will be required upon notification of acceptance to the program.



APPLICATION

Application forms and further information may be obtained by writing to:

Dr. H. G. Hedges
Room 106, Engineering Building
Michigan State University
East Lansing, Michigan 48823

All applications for admission should be postmarked on or before April 15, 1969.

1968 INSTITUTE PARTICIPANTS

The 1968 Institute had enrollees from four states with about fifty students attending from Michigan cities. The Michigan participants in the Institute were attending the following High Schools:

ALLEGAN - Allegan Senior High School
ANN ARBOR - St. Thomas
BATTLE CREEK - Lakeview High
BELDING - Belding High School
BIG RAPIDS - Big Rapids High School
BIRMINGHAM - Seaholm High School
CASNOVIA - Kent City Community Schools; Kent City, Michigan
CROSWELL - Croswell-Lexington; Croswell, Michigan
DETROIT - All Saints High School, Osborn High, Redford Union High School; Redford Township, Michigan
EAST LEROY - Athens High School; Athens, Michigan

EMPIRE - Glen Lake Community Schools; Maple City, Michigan
ESSEXVILLE - Garber High School
FLINT - Bentley Community Schools, Flint Central High School, Flint Northern High School, Flint Southwestern High School
FREESOIL - Mason County Central Schools; Scottville, Michigan
FREMONT - Fremont High School
GOBLES - Gobles High School
GRAND BLANC - Grand Blanc Community High School
GRAND RAPIDS - Kenowa Hills High School, Marywood Academy, South High School, West Catholic High School

GRANT - Grant Public High School
HAMILTON - Hudsonville High School; Hudsonville, Michigan
HAMTRAMCK - St. Ladislaus High School
HART - Pentwater High School; Pentwater, Michigan
HIGHLAND PARK - Highland Park
JACKSON - Jackson High School
KENT CITY - Kent City Community Schools
LUDINGTON - Mason County Central Schools; Scottville, Michigan
MIDDLETON - Fulton
MT. CLEMENS - L'Anse Creuse High School
MULLIKEN - Lakewood High School; Lake Odessa, Michigan

MUSKEGON - Muskegon Catholic Central
MUSKEGON HTS. - Muskegon Heights Senior High School
NEWPORT - St. Francis Xavier; Ecorse, Michigan
OWOSSO - Owosso High School
PETOSKEY - St. Francis Xavier
PONTIAC - Pontiac Central
REESE - Reese High School
ROCKWOOD - Monroe Catholic Central High School; Monroe, Michigan
ROYAL OAK - Kimball High School
SAGINAW - Saginaw High School
ST. CLAIR SHORES - Lake Shore High School
ST. JOSEPH - St. Joseph High School

SCOTTVILLE - Mason County Central Schools
SOUTH HAVEN - South Haven High School
STANTON - Central Montcalm High School
TRAVERSE CITY - St. Francis Central
UBLY - Ubyly Community School
UTICA - St. Lawrence High School
WARREN - Center Line High School; Center Line, Michigan, Cousino Senior High School, Warren Senior High School, Warren Woods High School

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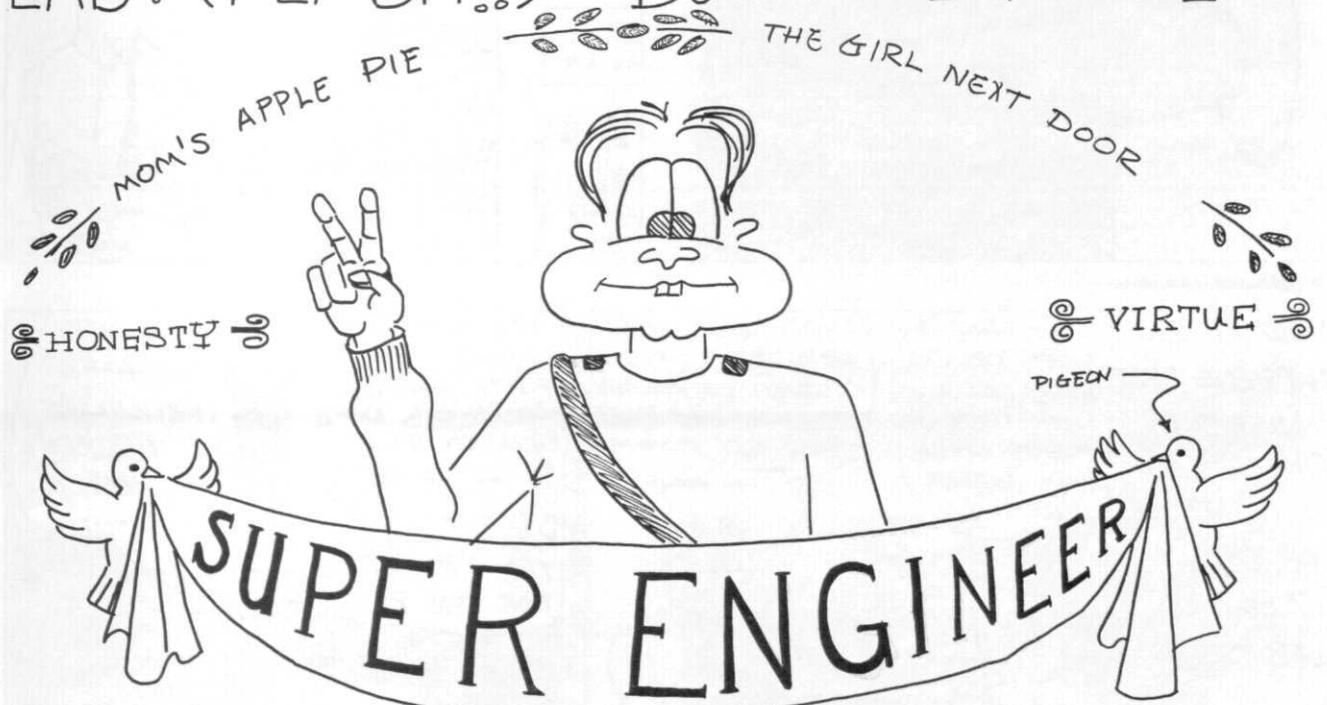
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Our Interviewer Will be Be On Campus On: February 5, 1969

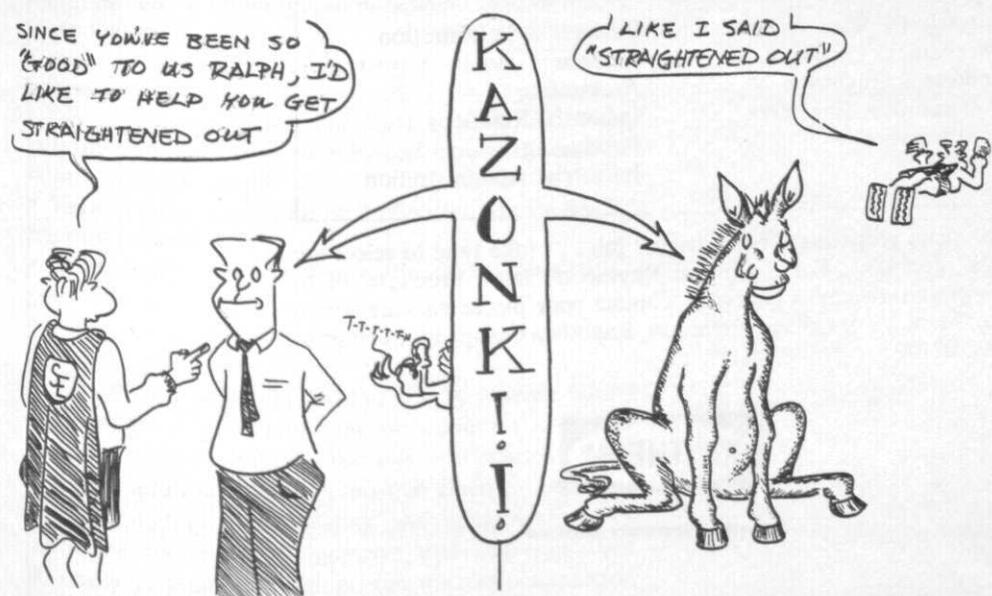
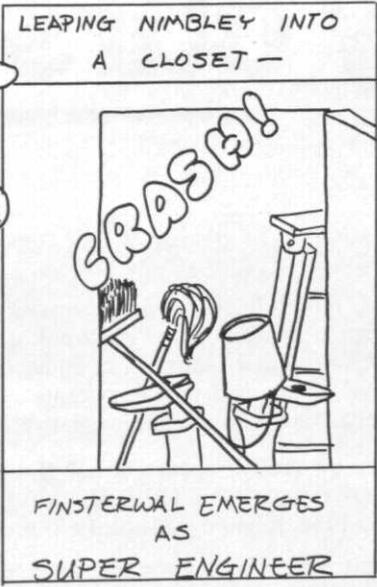
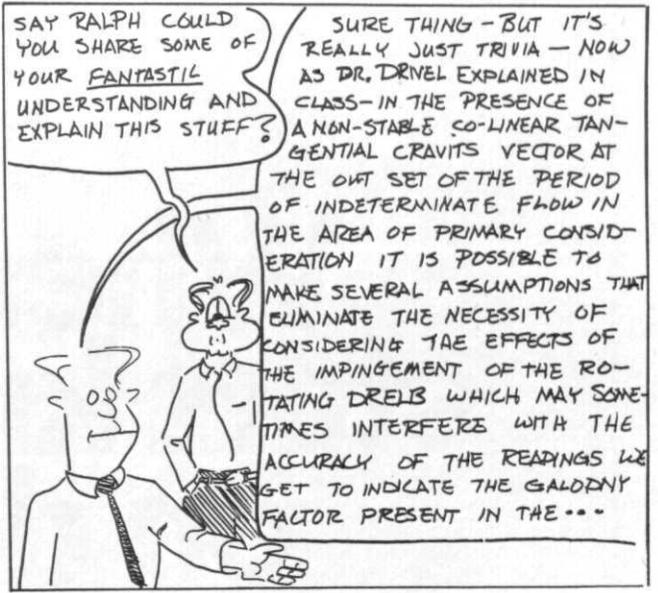
HOW OFTEN HAVE YOU SWEATED FOR ONE LITTLE CREDIT IN A LAB? (FLASH!!) - BUT HAVE NO FEAR



IS DEAD ON THE
CASE







AND SO ONCE AGAIN SUPER ENGINEER HAS MADE THE WORLD A SAFER PLACE FOR MOM TO MAKE APPLE PIE AND FOR ENGINEERS TO CHASE THE GIRL NEXT DOOR !!

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COMMUNICATION/COMPUTATION/CONTROL



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'THAT'S VERY NICE BUT DO YOU HAVE ANY OTHER ENGINEERING EXPERIENCE?'

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Of course, if your father's a millionaire, or you're about to marry an heiress, you have no problems. But, if not, then there's only one sensible thing to do. Come to work at Allison Division of General Motors.

There's nothing cold or cruel here. Just the opposite. Particularly if you're an engineer with big ideas. Aerospace projects? Allison's got them. Turbofan. Turbojet. Turbo-prop. Turboshaft. Military and commercial applications right across the board.

Maybe you're more down-to-earth. Fine. Some of Allison's

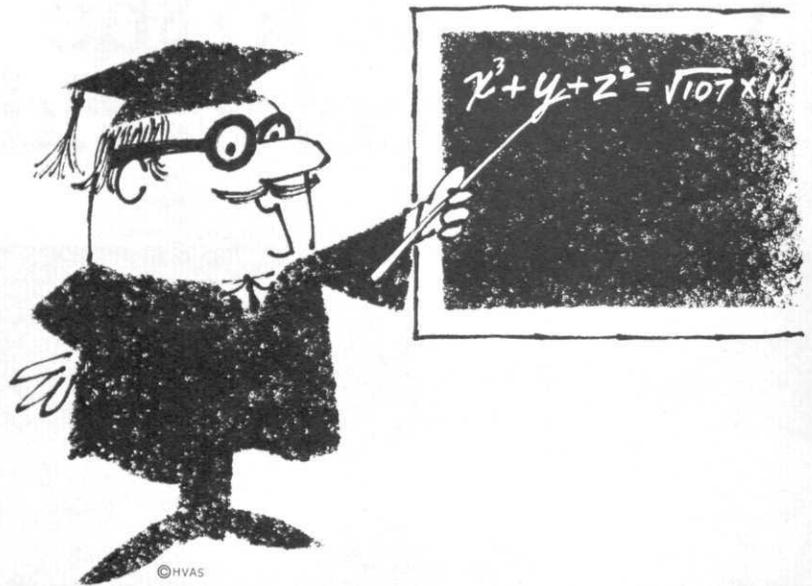
advanced military vehicle projects will be more your cup of tea. Like the new M551 General Sheridan, for instance. The powershift transmission, of course, is our specialty, and even the gun launcher is an Allison brainchild.

There's more. And you can be part of it. Take your time. Check them all. But don't forget Allison. Remember, life can be beautiful . . . even without an heiress.

Send for Allison's new brochure: Destination Tomorrow. Write: Ken Friedlein, Scientific Placement, Dept. 300, Allison Division of General Motors, Indianapolis, Ind. 46206.

Allison
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DR. SMITH IS MY INSTRUCTOR;

I SHALL NOT PASS.

HE MAKETH ME TO EXHIBIT MINE IGNORANCE
BEFORE THE WHOLE CLASS.

HE TELLETH ME MORE THAN I CAN WRITE,

HE LOWERETH MY GRADE.

YEA, THOUGH I WALK THROUGH THE CORRIDORS
OF KNOWLEDGE, I DO NOT LEARN.

HE TRIES TO TEACH ME;

HE WRITETH EQUATIONS BEFORE ME IN HOPES
THAT I WILL UNDERSTAND THEM.

HE BOMBARDETH MY HEAD WITH INTEGRATIONS,

MY SLIDERULE FREEZETH UP,

SURELY ENTHALPIES AND ENTROPIES SHALL
FOLLOW ME ALL THE DAYS OF MY LIFE.

AND I SHALL DWELL IN THE COLLEGE OF ENGINEERING
FOREVER.

An Engineer's Psalm

if not us...
WHO
if not now...
WHEN



- * Speculation concerning the future is a luxury no one can afford. Therefore, it is fortunate that you have the opportunity of talking to many companies before you make a final decision.

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if not now . . . WHEN?

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Sundays.



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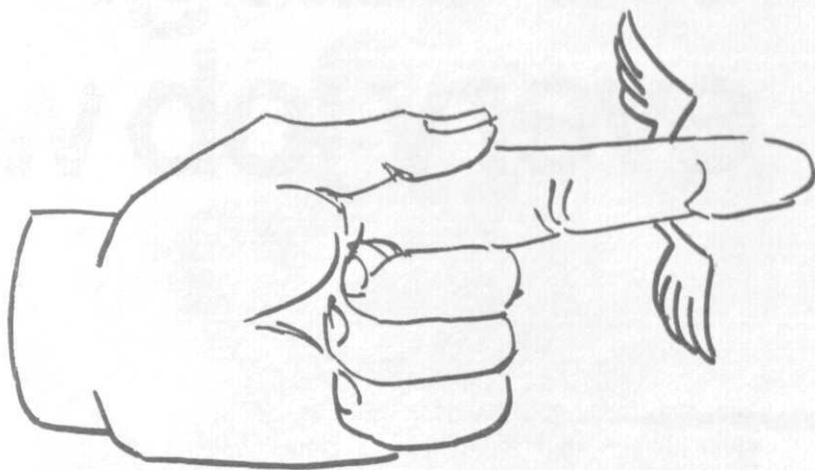
W. W. HOLMES • E. W. MACHAMER

February 4 & 5, 1969



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All those conscientious bureaucrats who so generously dispense the red tape found around the university.

We can give you every job we have.

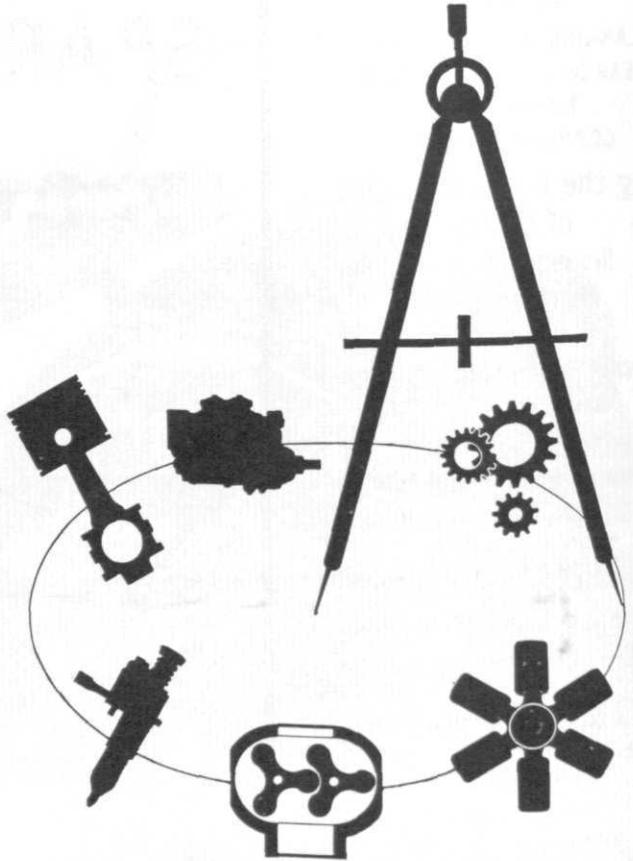
That's the way you discover the various opportunities in engineering at Detroit Diesel. As a young graduate, you probably haven't settled on a specific field. We have openings in manufacturing, product engineering and sales/service engineering. Once you make a choice, you start an informal work-rotation training program, tailored to your personal interests. You get to know the department before you take a permanent assignment.

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BETHLEHEM STEEL

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ENGRINEERS

The boy of ten, walked into a bar, and sat down at a table. A young barmaid walked over and asked the boy what he wanted. "Give me a shot of whisky!" he ordered.

"Do you want to get me in trouble?" she asked.

"Maybe later, right now all I want is a shot of whisky."

SE

Psychology Professor: "Young man, Why aren't you taking notes?"
Student: "I don't need to. I've got my father's."

SE

What do Eskimos get from rubbing noses?

Sniff-less.

SE

Q: Who put the last 15 bullets in Mussolini's head?

A: 273 Italian sharpshooters.

English instructor to E.E.: "Do you enjoy Browning?" E.E.: "No, but I sometimes have to resort to it around exam time."

The brush salesman was talking: "I'll never forget the time this woman opened the door in her negligee—which was kind of an odd place to have a door."

SE

SE

After feeling his way around a lamp post a few times, the sozzled C. E. muttered, "It's no use, I'm walled in."

"Hi, Charlie. How is your wife?"
"Compared to what?"

SE

C.E.: "Who's that?"

E.E.: "Oh, A girl I used to sleep with."

C.E.: "No kidding, where?"

E.E.: "M.E. 280 lectures."

SE

SE

A group of Colorado grade school children were being taken on a tour of the Denver Mint.

"Why is it," asked one of the kids, "that they stamp 'In God We Trust,' on the pennies?"

"That," explained the guide, "is for the benefit of E.E.'s who use them for fuses."

It's remarkable how much fun you can get laughing at the picture on your ID card before realizing that's what you really look like.

SE

"I don't like Bill," confided a coed to her roommate, "He knows too many dirty songs."

"Does he sing them to you?"

"Well, no — but he whistles them."

SE

Patience may often be the inability to make a decision.

Don't be afraid to use your brain, it's the little things that count.

SE

It takes two to make a marriage—a girl and an anxious mother.

