

# SPARTAN ENGINEER



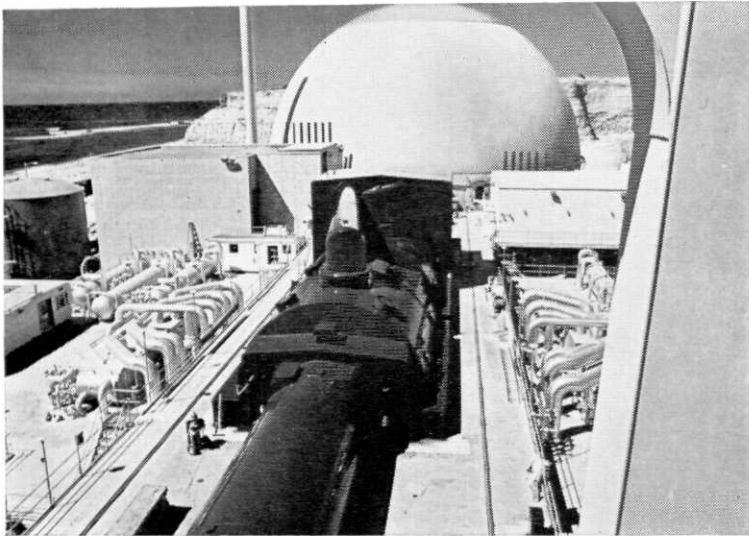
MAY, 1969

25c





# Westinghouse needs engineers who understand this generation



or this generation.



In the next ten years, demand for electricity will double. What's Westinghouse doing about it? Plenty. We're number one in commercial nuclear power. We're working on an advanced breeder reactor. We're spending \$450 million to boost our production capacity.

Okay, that's Westinghouse, the

electric company. What about Westinghouse, the schoolteacher? In its first two years, Westinghouse Learning Corporation had over 60 government and private contracts, including training for the Peace Corps, Job Corps, and private industry.

Which doesn't even start to describe Westinghouse. We're also in

computers, transportation, medical science, air pollution, oceanography, and more. Is that any way to run an electric company?

We think so. If you think so, talk with our campus recruiter, or write Luke Noggle, Westinghouse Education Center, Pittsburgh, Pa. 15221. An equal opportunity employer.

You can be sure...if it's

**Westinghouse**



# Is it possible to be passed by at 30?

Absolutely. If you're a 30-year-old engineer who's failed to keep up with the latest developments in his field.

Because Western Electric's an acknowledged industrial leader in graduate engineering training, that's one worry our engineers don't have. Our nearly-completed Corporate Education Center near Princeton, N. J., for instance, will have a resident staff of over 100. More than 310 engineering courses will be

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

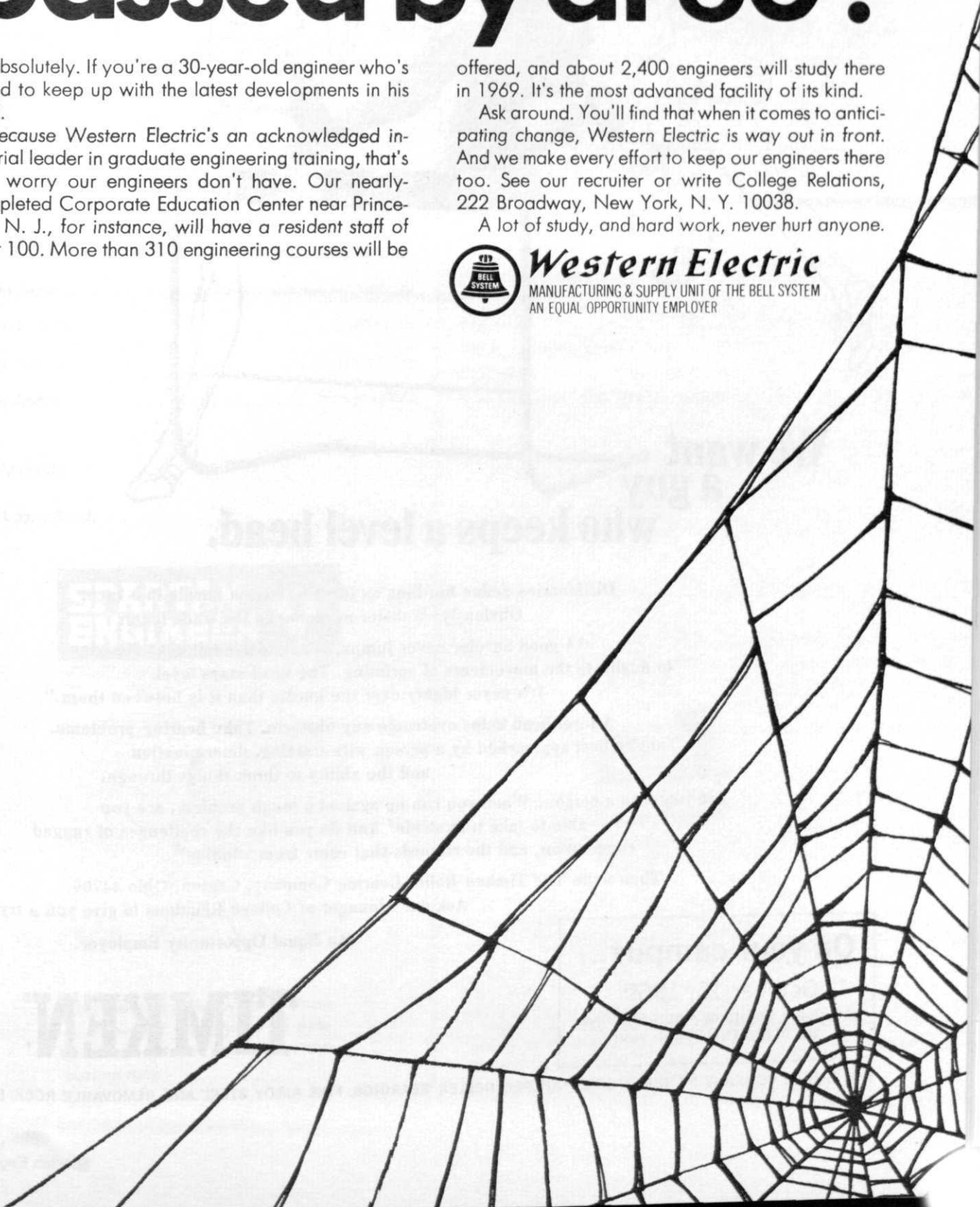
Ask around. You'll find that when it comes to anticipating change, Western Electric is way out in front. And we make every effort to keep our engineers there too. See our recruiter or write College Relations, 222 Broadway, New York, N. Y. 10038.

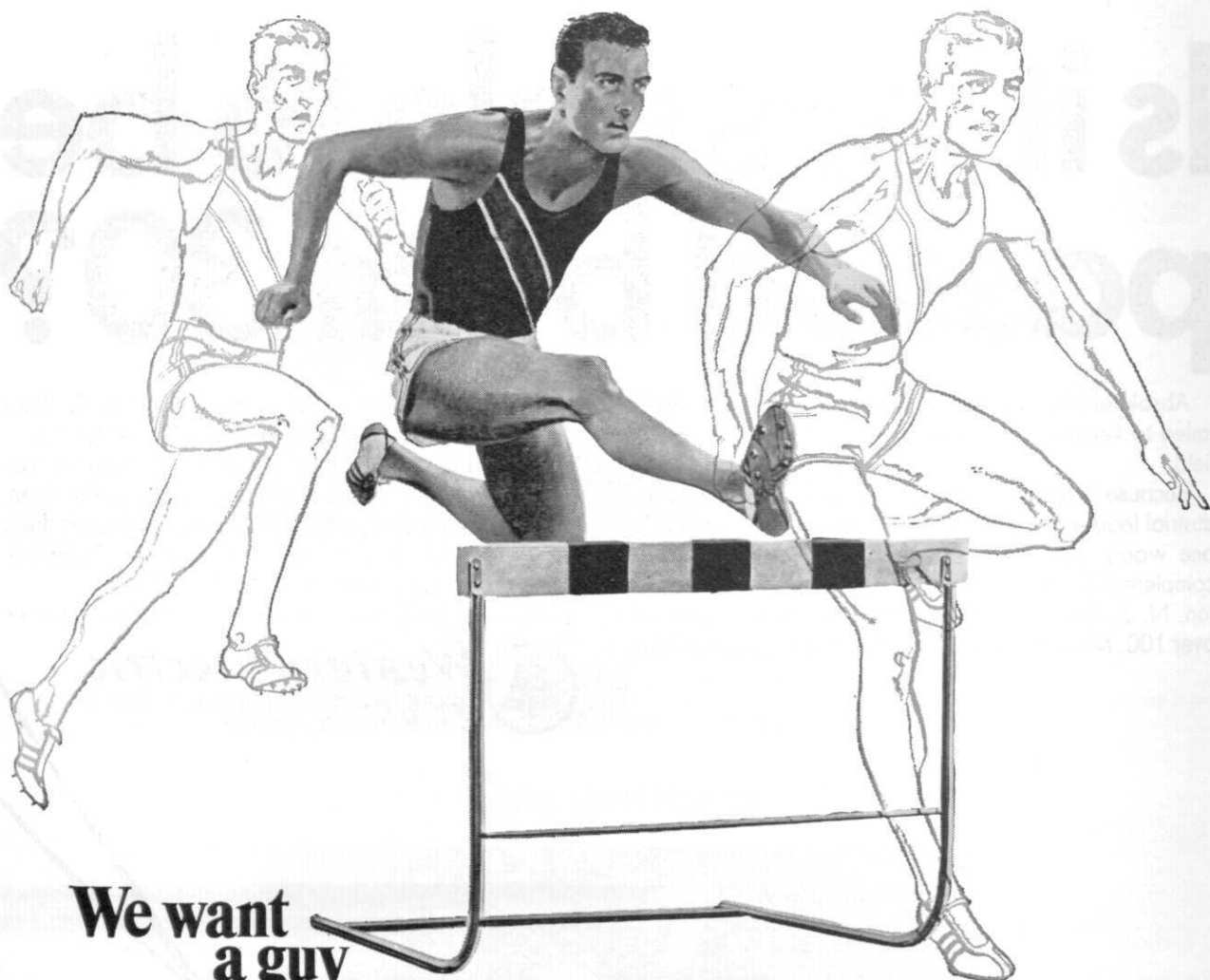
A lot of study, and hard work, never hurt anyone.



**Western Electric**

MANUFACTURING & SUPPLY UNIT OF THE BELL SYSTEM  
AN EQUAL OPPORTUNITY EMPLOYER





**We want  
a guy  
who keeps a level head.**

Dictionaries define hurdling as jumping over a hurdle in a race. Obviously, Webster never made the track team.

“A good hurdler never jumps,” the experts tell us. “He tries to duplicate the movements of sprinting. The head stays level. It’s never higher over the hurdle than it is between them.”

A level head helps overcome any obstacle. Take bearing problems. They’re best approached by a person with training, determination and the ability to think things through.

Are you such a person? When you run up against a tough problem, are you able to take it in stride? And do you like the challenges of rugged competition, and the rewards that come from winning?

Then write The Timken Roller Bearing Company, Canton, Ohio 44706.

Ask our Manager of College Relations to give you a tryout.

An Equal Opportunity Employer.

**On your campus...**

October 15, 1969

A Timken Company Representative  
would like to talk with you!

**TIMKEN®**

THE TIMKEN COMPANY MANUFACTURES TAPERED ROLLER BEARINGS, FINE ALLOY STEEL AND REMOVABLE ROCK BITS.

# SPARTAN engineer

MICHIGAN STATE UNIVERSITY

VOLUME 22

NUMBER 4

MAY, 1969

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Mr. Logan Blank



This month's cover by Davis Chase is a cheerful welcome to all June graduates. Hope you enjoy the bottom rung.

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# "I didn't spend four years in college just to work as a clerk."

Then come to work at IH.

We'll listen to you. And give you a chance to stand on your own two feet.

Right from the start.

You see, we believe your point of view is just as important as ours.

We want new ways to do things. Better ways. And this calls for fresh ideas.

That's why you'll have to be a thinker. An innovator. A guy who has the guts to stand up for what he thinks is right.

You show us your stuff, we'll give you the freedom to swing.

You'll find plenty of action in motor trucks, farm equipment, construction equipment and steelmaking.

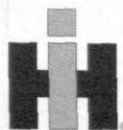
And the faster you prove yourself, the quicker you'll move up. Without a lot of red tape.

Get the picture? Now why not get into the act.

Talk to your campus placement officer about us. He'll give you the word on the good jobs we have in engineering, accounting, production management and sales.

Because the way we look at it, if we give you a good job you'll want to stick with us.

And that's exactly what we have in mind.



**INTERNATIONAL HARVESTER**

An equal opportunity employer M/F



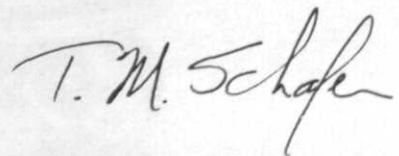
IH research engineers study fracture (see circle enlargement) of high strength steel in electron microscope. Scope has magnification potential of 5 million times.

# editorial

I've done some naive things in my life, but few as potentially costly as saying, "I'll never see this again" to a block of material in one of my courses. I remember saying it once as a sophomore while taking a math course. The magnitude of my error was vastly impressed upon me in one of my senior, major-area, required courses when that material which I had been so sure I would "never see again" turned out to be the only method presently used to solve a very important type of problem. Had I not gone, with great difficulty, back to that sophomore level material I would not be writing this editorial, continuing my education or contemplating as bright a future. Whether you are a freshman or a senior, if you ever say "I'll never see this again", you probably will. And you may not be as lucky as I was in having the time to play catch-up.

It has come to my attention that certain individuals have felt personally criticized in a recurring feature of this magazine. I would like to apologize and to try to set the record straight. Superengineer was not created to point out faults of individuals. Instead, it was supposed to show that there exist some areas where a little improvement wouldn't hurt, though, admittedly, the criticism wasn't "constructive" in the sense of advancing specific, better alternatives, it wasn't "destructive" in the SDS genre. The idea was to try to stimulate thought among students and faculty as to alternatives to, or improvements in, the institutions and/or attitudes which were our sometime targets.

Finally, I would like to thank the people throughout this College who gave more of themselves than just the bare minimum needed to get by. I speak of the administrators, staff, faculty and students who have put out 101% in order that this College of Engineering might be a better place this year than it was last year. Here's hoping that these people and those like them will continue to flourish here.



# You don't have to sacrifice critical properties for workability

With *cast-steel* you don't have to sacrifice critical properties like abrasion resistance just to get machinability or formability . . . Any steel composition can be cast directly to shape.

In this gyratory crusher, standing up to rough taconite and hematite ores meant using a difficult-to-work high carbon steel. Casting the critical spider arms not only eliminated machining and forming problems, but made an exceptionally rigid hollow box design economically feasible. . . . Seven other major components were also made of *cast-steel*—each composition selected for a specific job without compromise for working characteristics.

You can specify *cast-steel* components in compositions which are difficult or even impossible to machine, forge or weld. Whether you need hardness, toughness, resistance to heat and corrosion, or what-have-you, *cast-steel* frees you to choose the best composition and shape for design requirements.

Want to know more about *cast-steel*? We're offering individual students free subscriptions to our quarterly 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.



## STEEL FOUNDERS' SOCIETY OF AMERICA



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



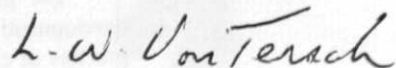
## Dear 1969 Engineering Graduate:

A number of years ago the College of Engineering formed its own alumni association in order to further improve the relationships between the College of Engineering and its graduates. We are interested in your career after graduation and would like to follow your professional growth and development. In order to do this we will keep a personal record of your college activities and add to this record as you progress in the profession.

We hope you will keep us informed of your activities and we will try to keep you abreast of alumni events and other activities and news of this College. It will be helpful if you will return the card which is being sent to you for this purpose.

I wish you the best of success in the final weeks of your college career.

Sincerely yours,



L. W. Von Tersch, Dean  
College of Engineering

# 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.*

## **Engineer's Wives**

The Engineer's Wives is made up of wives of students majoring in engineering. The purpose of the organization is to aid the wives in becoming acquainted with the field of engineering through lectures, movies and discussion, thus enabling them to better understand the future work of their husbands.

Meetings are held every month—all wives are invited to attend.

## **Eta Kappa Nu**

Eta Kappa Nu is an honor society for students in electrical engineering. Its purposes are to promote scholarship, to recognize the outstanding students, and to further the profession of electrical engineering.

Members are elected from the junior and senior classes in electrical engineering on the basis of outstanding scholastic work and character.

## **The Institute of Electrical and Electronics Engineers, Inc. (IEEE)**

The Michigan State Student Branch of the IEEE is a student organization for electrical engineers. It is affiliated with the Institute of Electrical and Electronic Engineers, Inc.

The purpose of the organization is the furtherance of the professional development of the student as well as increased knowledge of the theory and practice of electrical engineering and related sciences through lectures, films, and field trips.

Membership is intended for Electrical Engineers, both Graduate and Undergraduate, but is open to students enrolled in programs related to electronics, power systems, and computer science.

## **Chi Epsilon**

Chi Epsilon is the national civil engineering honorary fraternity. Its purpose is to bestow honor upon those civil engineering students of outstanding character who have demonstrated exceptional scholastic ability. The members are elected from the upper one third of the junior and senior classes in civil engineering.

The activities of Chi Epsilon include bi-weekly meetings which are professional and social in nature; bi-annual banquets; and other activities.



## With such genius, who needs a genie?

Verily, these young people demonstrate remarkable intellectual acumen, for a successful career is indeed more precious than great riches. And the guidebook to a rewarding career is none other than that perennial favorite, "Careers with Bethlehem Steel and the Loop Course." Pick up a copy at your placement office. Or write: Manager of Personnel, Bethlehem Steel Corporation, Bethlehem, PA 18016.

**BETHLEHEM STEEL**

*An Equal Opportunity Employer in the Plans for Progress Program*





# Your money and your life.



PHOTO: ERNEST BRAUN



You're living dangerously, and you love it.

You fought the professor all semester, and got an A in spite of it.

The girl you've been eyeing likes your style.

It's spring. That's dangerous.

But the one place where you shouldn't have to live quite on the edge is on the road. Now you don't, thanks to new safety features in cars . . . and the remarkable radial tire.

Radials are a marvelous invention in rubber and rayon cord. They last twice as long as regular tires, and even give you better gas mileage. On wet, slippery pavements, they grip like fly paper.

A point of interest—The Dynacor® rayon cord in radial tires is made by FMC Corporation, the same company that makes rayon for the "throwaway bikini" your date is working up courage to wear.

This same company that builds egg handling systems also builds fire engines.

Each day you see FMC products around and you've never known it.

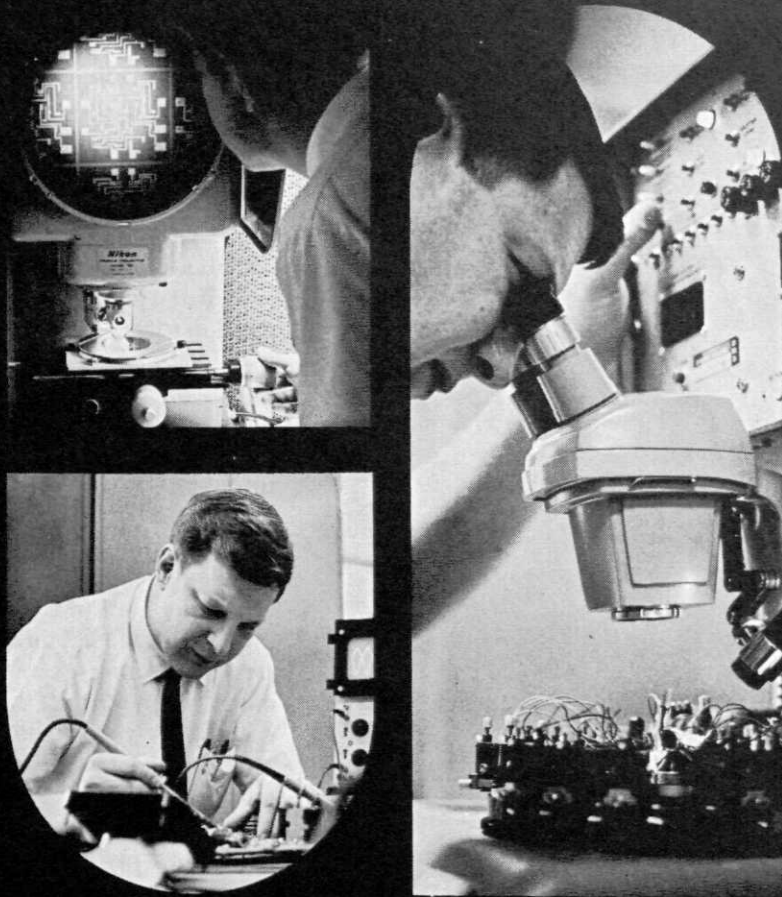
FMC also makes petrochemicals, pumps, freeze dry equipment, practically anything dealing with food growing machinery and industrial chemicals, and more. We are one of the country's top 60 corporations.

FMC is a creative company that's making an impact on the American way of life. Perhaps you'd like to help. For more information, write for our descriptive brochure, "Careers with FMC." FMC Corporation, Box 760, San Jose, California 95106. We are an equal opportunity employer.



**FMC CORPORATION**

Putting ideas to work in Machinery,  
Chemicals, Defense, Fibers & Films



## Which discipline will Ed Whitaker use tomorrow

When Delco says multi-disciplinarian, they mean it. Just ask Ed Whitaker. And the solid professionals who have helped him grow into jobs like developing the microcircuits for a fire and overheat detection computer for jet aircraft. Twenty-five hundred components in a package 4" x 2" x 1/2". From concept to hardware in eight months flat. And then a fast hop to Air Force testing. From beginning to final delivery, Ed was a full member of the team. The question is . . . does your job permit you this kind of growth? Take a good look at how your career shapes up, compared with Ed Whitaker's and his colleagues at Delco. You might even call us collect. Or, write: Mr. C. D. Longshore, Supervisor, Salaried Employment, Dept. 600, Delco Radio Division of General Motors, Kokomo, Indiana.

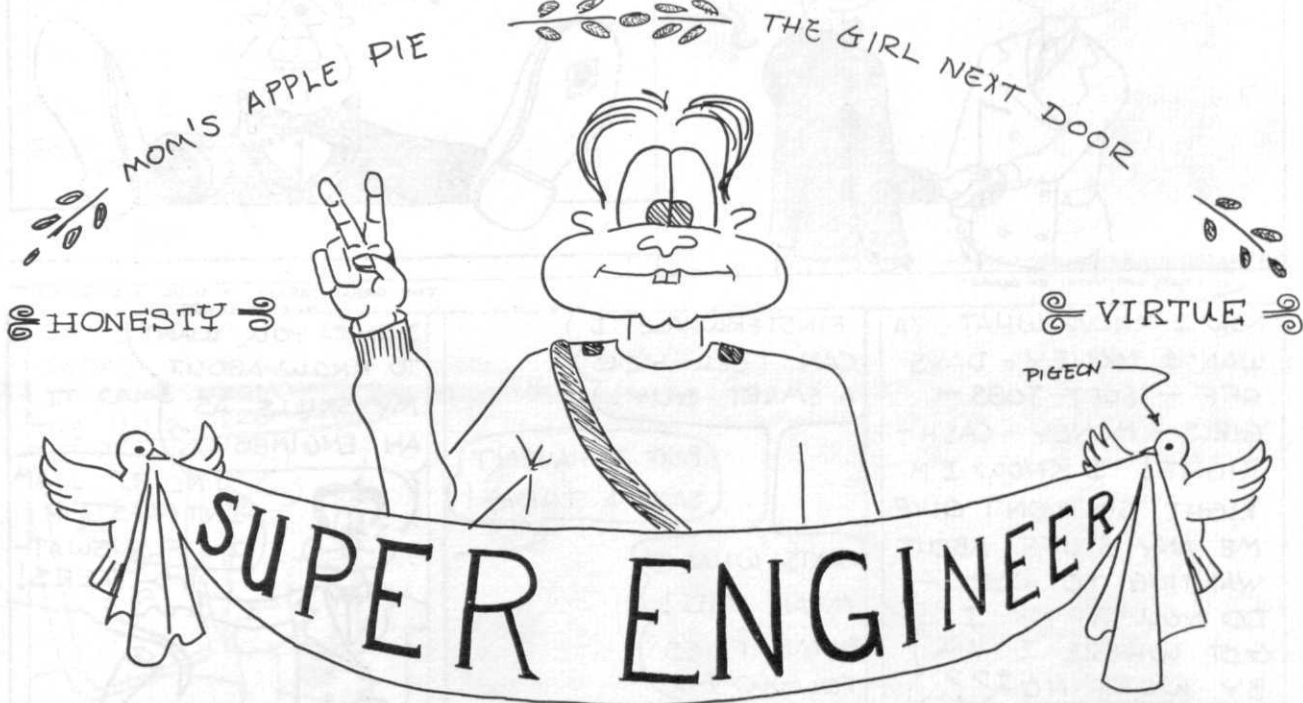
**DELCO  
RADIO**



AN EQUAL OPPORTUNITY EMPLOYER  
DIVISION OF GENERAL MOTORS  
KOKOMO, INDIANA



HAVE YOU EVER BEEN GIVEN  
 A "RIDE" ON AN INTERVIEW?  
 WELL <sup>THAT MEANS YOU ANDRE</sup> TURKEY BAIT - PUT  
 YOURSELF AT EASE 'CAUSE -



IS DEAD ON THE  
 CASE

SUPER ENGINEER'S FLIGHT  
 SUIT BY FRUIT OF THE LOAM

AS WE OPEN THIS  
 - STUPENDOUS - INCREDIBLE  
 FANTASTIC EPISODE  
 IN THE LIFE OF  
 THAT COLORFUL  
 PARAGON OF VIRTUE  
 MANSFIELD  
 FINSTERWAL  
 WE FIND MANNY  
 CONTEMPLATING  
 THE PROSPECT OF  
 FINDING A JOB !!



BUT OUR HERO  
 KNOWS HE CAN'T  
 HACK OFF FOR -  
 EVER SO OFF HE  
 GOES TO SIGN UP  
 FOR A FEW INTER  
 VIEWS. INSTEAD OF  
 SIGNING UP FOR  
 INTERVIEWS WITH  
 LARGE COMPANIES,  
 MANNY PICKS  
 SMALL ONES -.



HELLO MR WILLIAM I'M-

YES-YES YOU'RE FINSTERWHALE - GLAD T' SEE YA -

BUT JUST CALL ME SUDSY



SUDSY WILLIAM ... NOW TELL ME WHATCHER AFTER - AND DON'T GIVE ME ANY STUFF ABOUT A MEANINGFUL EXPERIENCE !!

BUE-E-E-E

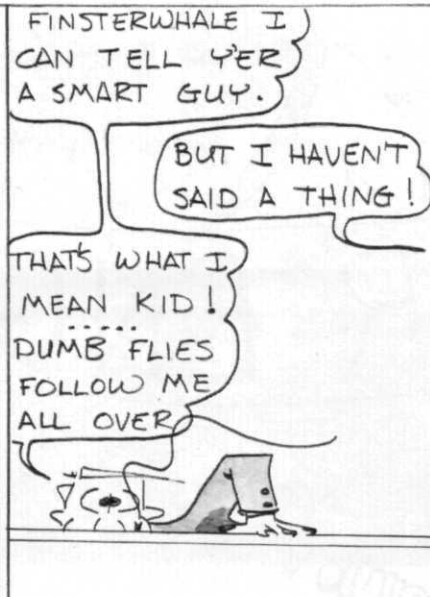
Hum-m-m

(THIS BLURB WAS CAUSED BY DEMONS)

THE GREAT TURKEY IS ALIVE AND LIVING IN ANN ARBOR



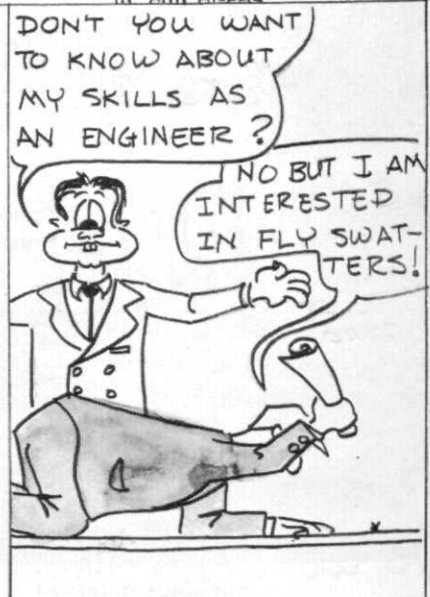
NOW I KNOW WHAT YA WAN': MONEY - DAYS OFF - SOFT JOBS - GIRLS - MONEY - CASH - RIGHT! I KNOW I'M RIGHT SO DON'T GIVE ME ANY STUFF ABOUT WANTING TO WORK - DO YOU THINK I GOT WHERE I AM BY WORKING\*??



FINSTERWHALE I CAN TELL Y'ER A SMART GUY.

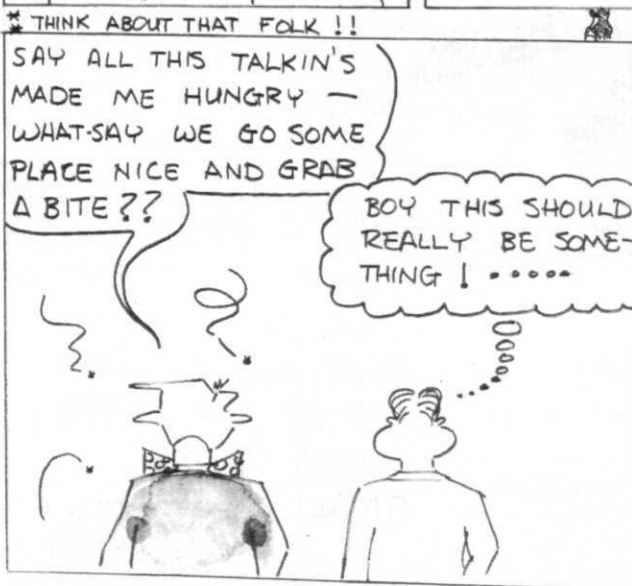
BUT I HAVEN'T SAID A THING!

THAT'S WHAT I MEAN KID! DUMB FLIES FOLLOW ME ALL OVER



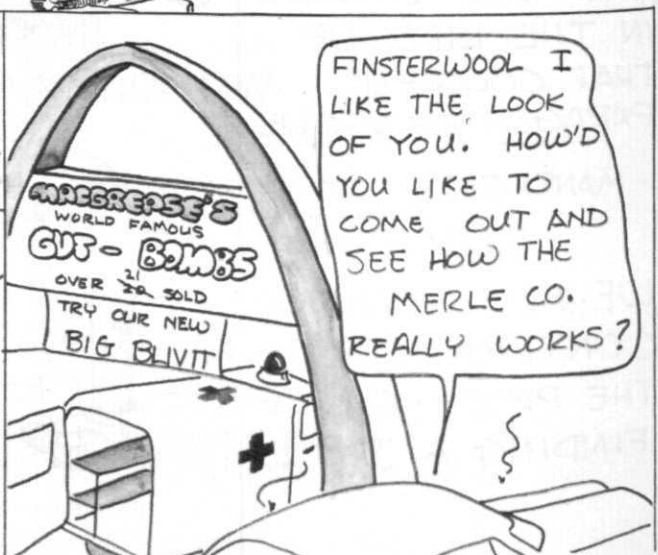
DONT YOU WANT TO KNOW ABOUT MY SKILLS AS AN ENGINEER?

NO BUT I AM INTERESTED IN FLY SWAT-TERS!



SAY ALL THIS TALKIN'S MADE ME HUNGRY - WHAT-SAY WE GO SOME PLACE NICE AND GRAB A BITE??

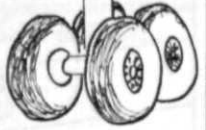
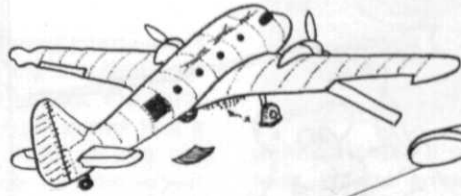
BOY THIS SHOULD REALLY BE SOME-THING! .....



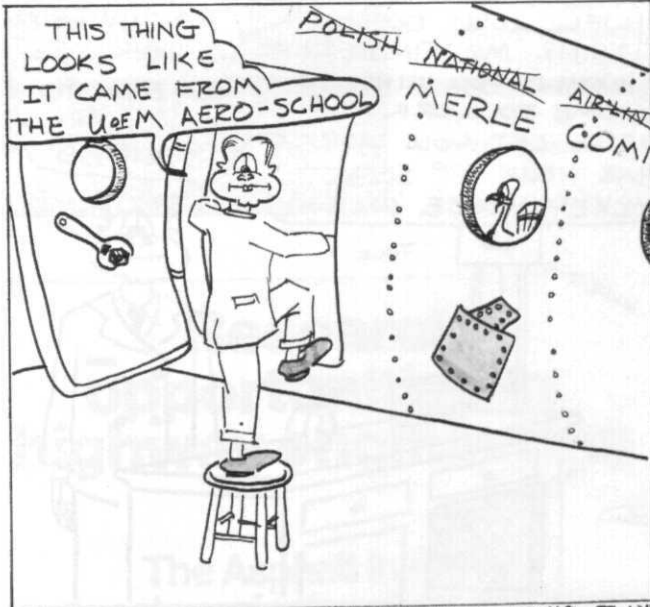
WAGREAST'S WORLD FAMOUS GUT-BANES OVER 20 SOLD TRY OUR NEW BIG BLVIT

FINSTERWOOL I LIKE THE LOOK OF YOU. HOW'D YOU LIKE TO COME OUT AND SEE HOW THE MERLE CO. REALLY WORKS?

SO ON THE APPOINTED DAY MANNY MAKES HIS WAY TO THE AIRPORT TO BOARD THE MERLE CO'S PRIVATE EXECUTIVE TRANSPORT.



\* THIS WAS WALK - AFTER ALL IT IS A POLY AIRLINE

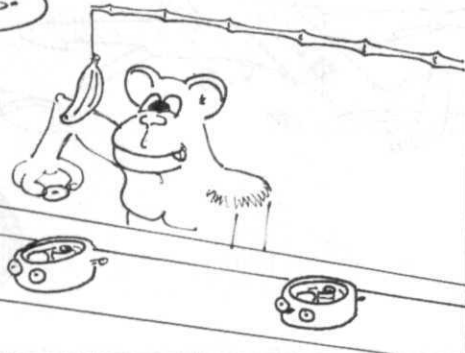


BASIC LAWS OF ENGR. 1. IF ANYTHING CAN GO WRONG IT WILL 2. ALL CONSTANTS ARE VARIABLE 3. DIMENSIONS WILL BE (FOR THOSE GRADS. WHO DONT KNOW THEM YET) EXPRESSED IN THE LEAST USEFUL UNITS I.E. VELOCITY IN FURLONGS/FORTNIGHT





NOW HERE WE CAN SEE OUR MAIN FABRICATION SECTION. AS YOU CAN SEE THE MERLE CO. SPARES NO EXPENSE IN ANY PORTION OF ITS ENDEAVORS.



THIS IS THE MERLE CO'S TESTING AREA WHERE EXHAUSTIVE TESTS ARE CARRIED OUT TO INSURE THE CONSTANT QUALITY OF OUR PRODUCTS.



4. A DROPPED TOOL WILL LAND WHERE IT CAN DO THE MOST DAMAGE (ALSO KNOWN AS THE LAW OF SELECTIVE GRADUATION).  
 5. INTER-CHANGEABLE PARTS WON'T. 6. IF A PROTOTYPE FUNCTIONS PERFECTLY, SUBSEQUENT PRODUCTION UNITS WON'T.

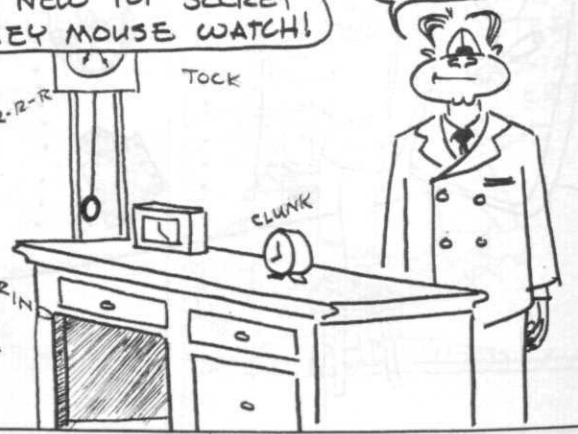
NEEDLESS TO SAY OUR HERO IS AGOG AT ALL THE WONDERS (AS MUCH FUN AS A FLUIDS LAB - RIGHT) HE HAS SEEN - HE NEVER DREAMED THINGS WERE LIKE THIS IN THE "REAL" WORLD. AND NOW HE FINDS HIMSELF IN THE OFFICE OF THE PRESIDENT OF THE MERLE CO. PETER C. MERLE

IDLE HANDS MEAN YOUR WATCH HAS STOPPED

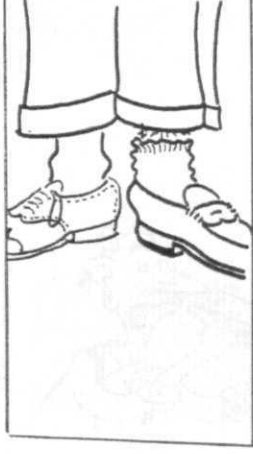


WELL WHAT DO YOU THINK MR. FINSTERWAL WOULD YOU WIRE TO COME TO WORK FOR US? WE'LL LET YOU WORK ON OUR NEW TOP SECRET MCKEY MOUSE WATCH!

NO, THANK YOU - I THINK I'LL GO BACK TO SCHOOL ... BESIDES



I'VE GOT ALL THESE WHITE SOCKS TO WEAR OUT!



THANK-YOU SO VERY MUCH FOR THE "NEAT" TIME YOU'VE SHOWN ME AND PLEASE DON'T BOTHER



ABOUT THE TRIP HOME I GET THERE UNDER MY OWN POWER.

WITH THAT OUR HERO REMOVES HIS DISGUISE AND ONCE AGAIN ASSUMES THE ROLE OF SUPER ENGINEER

LEAPING ADROTTLY THROUGH AN OPEN-CRASH - A CLOSED WINDOW HE LUMBERS OFF INTO THE AIR POLLUTION



LOOK UP IN THE SKY! IT'S A BIRD!  
 IT'S A PLANE!  
 NAW IT'S JUST SOME TURKEY IN PINK AND GREY LEOTARDS!

# TOUGHNESS

One of the outstanding advantages of Malleable Iron Castings.

Toughness is the ability of a material to withstand impact or repeated loading.

Any material will fail. The key in Malleable is that it will not fail suddenly. Under severe impact, Malleable will bend or stretch before fracture occurs.

Malleable's impact strength is illustrated in this test by a truck manufacturer. To be absolutely sure

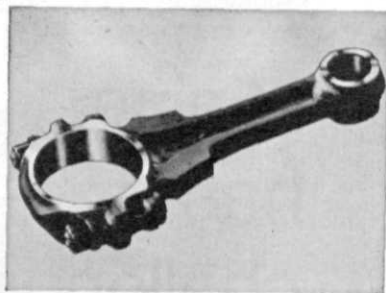


of the strength of many components in the cab, including the Malleable iron cab support hinges, the truck was crashed at high speed into a barricade of ice. Although the cab itself was battered beyond repair, there was no damage to the Malleable parts, proof of the outstanding impact resistance of this material.

Another facet of toughness is a material's ability to withstand repeated loads of low magnitude. Failures of this type are due to fatigue, and usually start with the appearance of a crack at the stressed area which progresses through the part until fracture occurs.

Fatigue strength is a major factor in design of automotive connecting rods. The loads on these parts alternate between tension and compression of varying magnitudes. In de-

signing a Pearlitic Malleable iron connecting rod, a thorough series of experiments was conducted which



demonstrated that the castings have fatigue properties which exceed the performance requirements of modern automobile engines.



**MALLEABLE FOUNDERS SOCIETY**  
UNION COMMERCE BUILDING  
CLEVELAND, OHIO 44115

## Research opportunities in highway engineering

### The Asphalt Institute suggests projects in five vital areas

Phenomenal advances in roadbuilding techniques during the past decade have made it clear that continued highway research is essential.

Here are five important areas of highway design and construction that America's roadbuilders need to know more about:

**1. Rational pavement thickness design and materials evaluation.** Research is needed in areas of Asphalt rheology, behavior mechanisms of individual and combined layers of pavement structure, stage construction and pavement strengthening by Asphalt overlays.

Traffic evaluation, essential for thickness design, requires improved procedures for predicting future amounts and loads.

Evaluation of climatic effects on the performance of the pavement structure also is an important area for research.

**2. Materials specifications and construction quality-control.** Needed are more scientific methods of writing specifications, particularly acceptance and rejection criteria. Additionally, faster methods for quality-control tests at construction sites are needed.

**3. Drainage of pavement structures.** More should be known about the need for sub-surface drainage of Asphalt pavement structures. Limited information indicates that untreated granular bases often accumulate moisture rather than facilitate drainage. Also, indications are that Full-Depth Asphalt bases resting directly on impermeable subgrades may not require sub-surface drainage.

**4. Compaction and thickness measurements of pavements.** The recent use of much thicker lifts in Asphalt pavement construction suggests the need for new studies to develop and refine rapid techniques for measuring compaction and layer thickness.

**5. Conservation and beneficiation of aggregates.** More study is needed on beneficiation of lower-quality base-course aggregates by mixing them with Asphalt.

For background information on Asphalt construction and technology, send in the coupon.

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THE ASPHALT INSTITUTE  
College Park, Maryland 20740

Gentlemen: Please send me your free library on Asphalt Construction and Technology.

Name \_\_\_\_\_ Class or rank \_\_\_\_\_

School \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

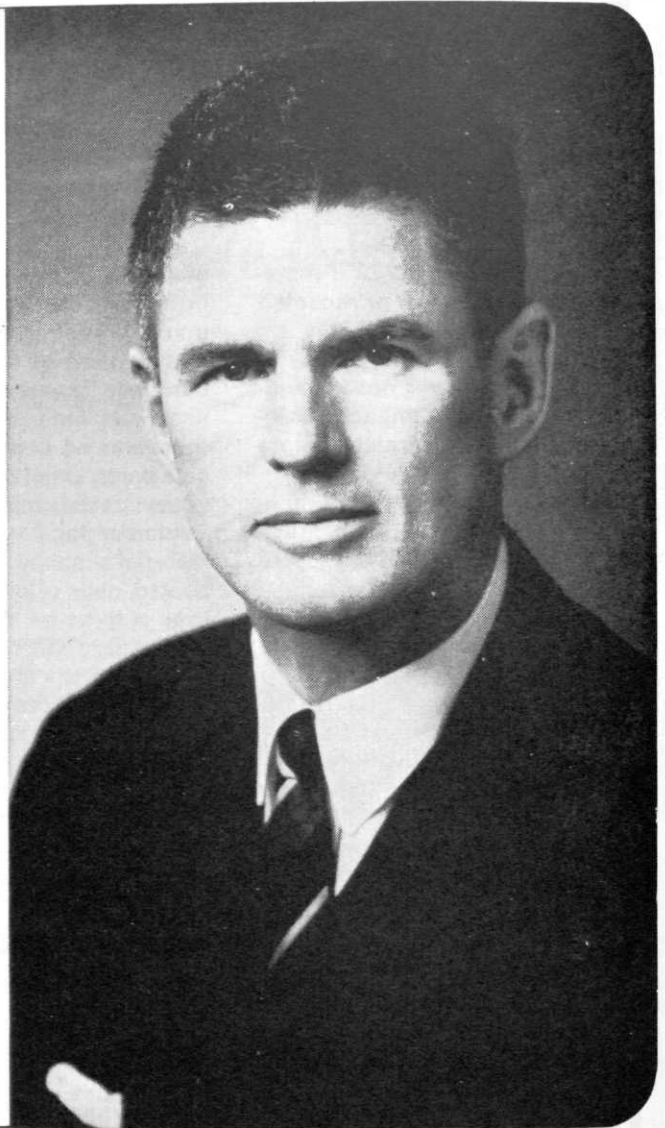
## The Asphalt Institute

College Park, Maryland 20740



“Mining has a challenging future for men with the desire to be challenged.”

Lawrason Riggs III,  
President



“The ‘pick and mule’ days of mining are gone. □ We in the minerals and metals industry are using many highly sophisticated production tools in our enterprises, and it is a fact that this great basic industry has introduced automation and computerization in every area from planning and production, to marketing and sales. □ At St. Joe we take special pride in having developed, with our own engineers, one of the most modern mines and mills in the world — our Fletcher facility in Missouri. We constantly seek, moreover, new and better ways to make older mines more productive and efficient in this era of increased competition. □ Added to this is St. Joe’s

continuing exploration program carried on both here and abroad, seeking new deposits of lead, zinc, and other minerals to meet the demands of an expanding international market. □ Wherever you look — in our mines and mills, our research and development laboratories—there are challenges for young engineers with imagination and enthusiasm. □ Whatever your field of interest, be it civil, electrical, mining, metallurgical or chemical engineering —at St. Joe there’s an opportunity to use your talents and imagination, and to work with men with the knowledge and experience that have made St. Joe a leading member of the mining and metals industry.”

**ST. JOE**

Producers and Marketers of Lead, Zinc, Zinc Oxide, Iron Ore Pellets, Iron Oxide, Agricultural Limestone, Cadmium, Copper Concentrates, Silver and Sulphuric Acid.

ST. JOSEPH LEAD CO., 250 Park Avenue, New York, New York 10017

SJ-354



# Eaton Yale & Towne has an outstanding opportunity for Industrial Engineering graduates.

We've created a special program to give you invaluable experience in all phases of manufacturing engineering: product processing and costing techniques; systems analysis and development; plant equipment and facilities layout; design of tools, dies, and gauges; industrial relations; materials handling; shop supervision; and work measurement.

You'll be assigned to our manufacturing engineering Technical Center in Cleveland, Ohio. Here you will receive carefully selected project assignments at many different Eaton Yale & Towne manufacturing plants.

This program leads directly to placement at one of our division locations in 45 cities, 17 states, and 18 nations of the world. You'll see no end of challenges. We produce 3,000 products for all kinds of business and industries.

In addition to our special program for industrial engineers, we offer mechanical and electrical engineers unique opportunities in research, product engineering, manufacturing engineering, and sales engineering.

Check your placement office for an interview date or send your resume to Richard S. Potter, Director of Management and Technical Recruitment.



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# ENGRINEERS

Two men met at a cocktail party and as they stood talking, one glanced across the room and remarked, "Get a load of that ugly woman over there, with a nose like a pomegranate and what looks to be a fifty-five-inch waistline."

"That's my wife," said the man.

"Oh, I'm sorry," said the first man.

"You're sorry?"

\*\*\*

While lecturing the Sunday schoolers on the nature of sin and damnation, the rural minister asked one lad: "Do you know where little boys and girls go when they do bad things?" "Yes, sir," replied the boy. "Back of Fogarty's barn."

\*\*\*

Ever hear about the Aggie who stepped in a fresh cow pile and muttered, "My gosh, I'm melting!"

\*\*\*

Victor went to a Polish wedding. The guys at the office began to wonder when he didn't show up for work the next day. Finally, two weeks later, in walked Victor. Naturally the guys were a little curious, so they asked him what happened.

"Well, after the ceremony, there was this enormous reception—drinking, dancing, fun-and-games. And they had this drawing for door prizes, too. Well, I got lucky and won second prize—two weeks alone with the bride!"

"What was first prize?"

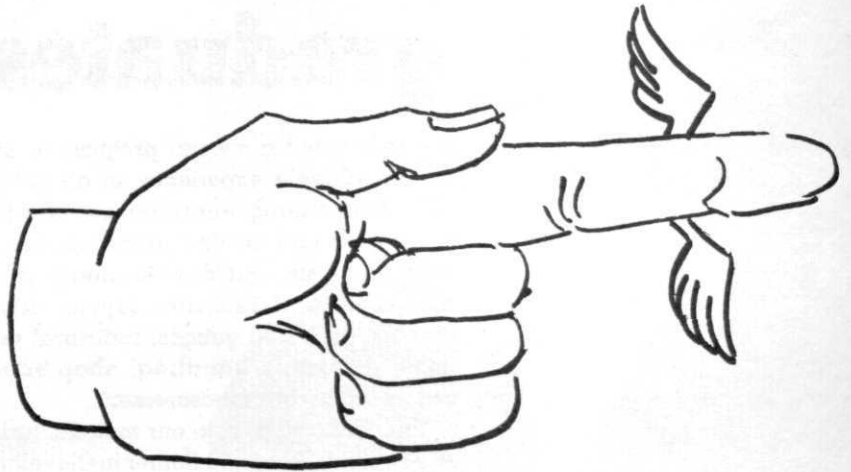
"\$1.25!"

\*\*\*

Did you hear about the Ag.E. who entered the Indianapolis 500 and won, making only five pit stops? Two for gas and three for directions.

\*\*\*

It's just been discovered that Adam was a Polack. Who else would sit next to a naked woman and eat apples?



## SPARTAN ENGINEER

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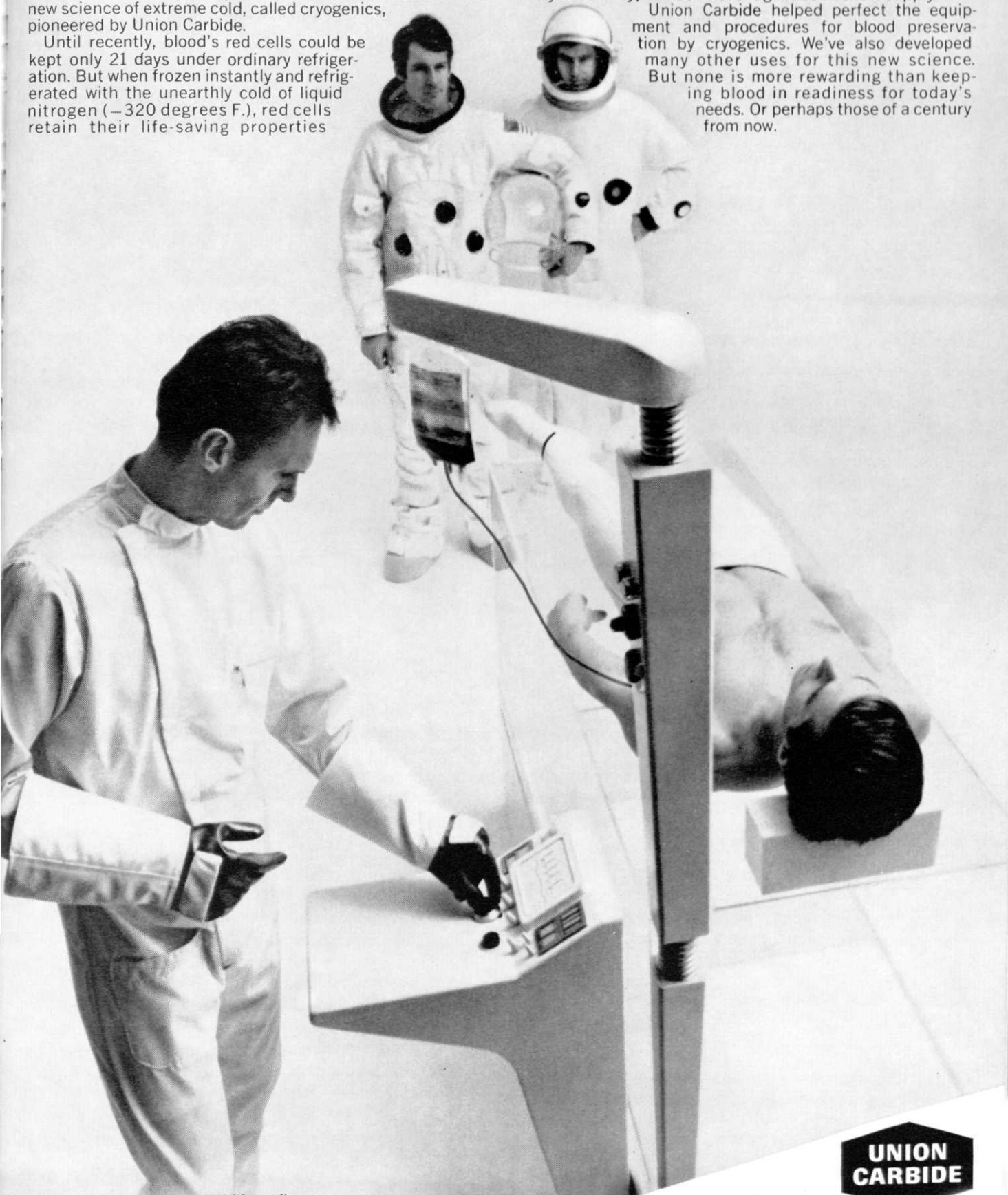
This revolutionary prospect comes from advances in the new science of extreme cold, called cryogenics, pioneered by Union Carbide.

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Union Carbide helped perfect the equipment and procedures for blood preservation by cryogenics. We've also developed many other uses for this new science. But none is more rewarding than keeping blood in readiness for today's needs. Or perhaps those of a century from now.

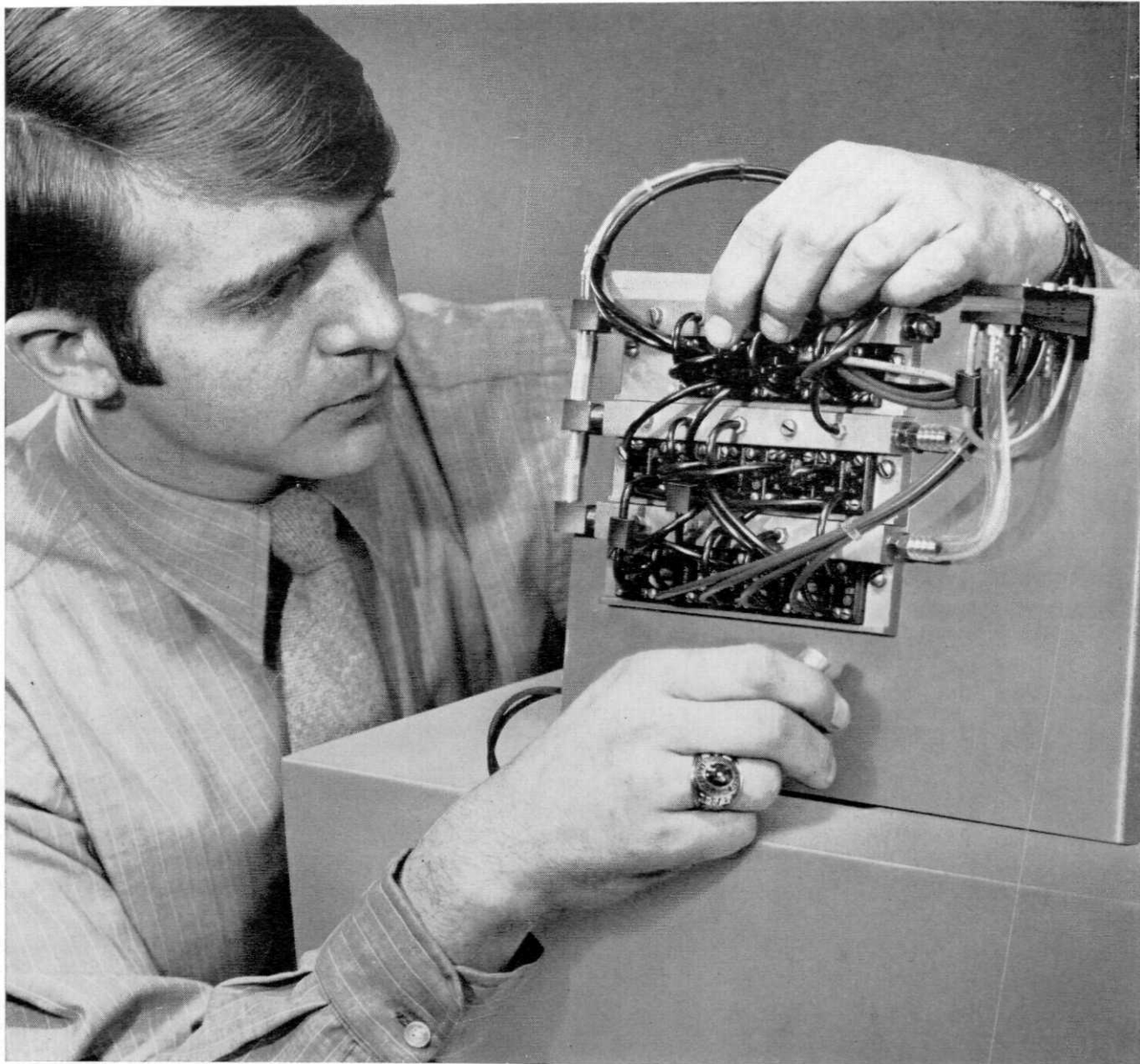


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## Jim Brix is helping raise an infant technology

As an undergraduate Jim Brix recognized the potential of an infant technology known as fluidics.

Now, after a BSEE degree from South Dakota State University '67, Jim's devoting full-time at General Electric to solving some uniquely difficult control system problems.

By combining the use of fluid flow and the interaction of forces, fluidic circuits can perform logic, amplification and control system functions. The absence of moving parts promises almost indefinite operating life, with improved safety and reliability. These advantages can push back frontiers in space exploration, manufacturing, transportation, and medicine, to mention only a few.

With this potential, fluidics is almost certain to have a technological impact similar to the one solid-state devices made recently in electronics.

Fluidics is one of many fledgling technologies General Electric people are pursuing to improve man's life in and beyond the 70's. If you'd like to know more about fluidics or another area of technology, write and tell us of your interests. General Electric Company, Dept. 801R, 570 Lexington Avenue, New York, N. Y. 10022.

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