In This Issue:

WILL IT PAY?
PARKERS I HAVE KNOWN
GOT ANY PROBLEMS?
In choosing your career...consider United States Steel
...the leader in the one industry that's truly basic!

Molten iron runs white hot from a huge ladle into an open hearth furnace for conversion into steel. The quality of this steel is the responsibility of this engineer. He also assists in coordinating open hearth operations and incoming raw materials and plans improvements in methods. This is a typical example of one of the many opportunities for engineering graduates at United States Steel.

For complete information on the opportunities available at United States Steel for young men of ambition and foresight, send for a copy of our free book—*Paths of Opportunity*. Doing so may very well be the beginning of a successful and rewarding career for you at United States Steel.

UNITED STATES STEEL
The Coldest Cold

Temperatures within a fraction of a degree of absolute zero are produced routinely by Westinghouse scientists in their search for more knowledge of the important phenomena of superconductivity. These phenomena rank with the nature of nuclear forces as one of the most fundamental problems facing the theoretical physicist. When superconductivity is completely understood, its principles could well revolutionize the electrical and electronic industries.

The basic principles of superconductivity have eluded an explanation since 1911 when the first example of the complete disappearance of electrical resistance in metal was discovered. Today scientists at the Westinghouse Research Laboratories in Pittsburgh, are making significant contributions to the field by their low-temperature research.

Superconductivity occurs in certain metals, alloys and compounds which, below characteristic transition temperatures, completely lose their electrical resistance. While in this superconducting state, they are perfectly diamagnetic, i.e. will completely exclude magnetic flux when placed in a magnetic field.

While this fundamental research is being conducted by theoretical physicists in search of knowledge and understanding of first principles, from even the terse description above of superconductivity, the imagination begins to run wild with engineering applications. An electronic computer using superconductivity memory elements will switch 10,000 times faster than conventional computer elements, will store 10 times as much information per unit space as ordinary computers. If the conditions can be fulfilled to make a substance superconductive in temperature regions other than that around absolute zero, design of every electrical or electronic product will be radically changed. Imagine considering the commonest electrical design problem without having to take into account electrical resistance!

While these exciting considerations whet the imagination, they are not the primary object of the low-temperature research going on at Westinghouse. This and many other research projects are being conducted to discover new phenomena and new knowledge of the universe. It is done on the belief that all research is an investment in tomorrow.

To the young, creative engineer this means exciting opportunities for graduate engineers in these exciting fields:

- ATOMIC POWER
- RADAR
- AUTOMATION
- SEMICONDUCTORS
- JET-AGE METALS
- ELECTRONICS
- LARGE POWER
- CHEMISTRY
- EQUIPMENT

... and dozens of others

For more information on Westinghouse research in the field of superconductors and low-temperature studies, or information on job opportunities, write Mr. J. H. Savage, Westinghouse Electric Corp., P.O. Box 2278, Pittsburgh 30, Pa.
SUSPENSION STORY—Chuck Steger, M.E. '52, probing dynamic properties of new Air Spring developed by Von Polhemus (r.). A nationally recognized authority on suspension systems, Mr. Polhemus directs Structure and Suspension Development Group of GM’s Engineering Staff, helps guide Chuck in his professional career.

Because engineering is a profession at GM—we offer you a career—not a job

One reason engineering standards at General Motors are so high is that General Motors recognizes engineering as a profession. And the men who engineer the many different products made by GM are respected for the profession they practice.

That is why, when you are invited to join GM as an engineer, you don’t simply take a job—you start a career.

It is a career that is rewarding both professionally and financially—starting on your first day of association with GM at any one of its 35 divisions and 126 plants in 70 cities and 19 states.

During your early days at GM, for example, you work with a senior engineer who guides your career along professional lines.

You are also actively encouraged to pursue your education towards an advanced degree. For we at General Motors recognize that, in doing so, you will become more valuable to us and the engineering profession.

You are given the opportunity to obtain professional recognition through participation in engineering society forums, presentation of technical papers, winning of patents and other recognition of your accomplishments.

And you are also encouraged to take an active role in your community’s affairs—because a truly professional man is a good citizen as well as a good engineer.

All this is for a reason—and a good one.

Many of the men who will fill the key positions at GM in the future are the young engineers joining GM today. This is not theory, it is fact. For 14 of our 33 Vice-Presidents are engineers, 23 of our 42 Division General Managers are engineers, too.

Today we are looking for young engineers—such as you—who may fill these positions tomorrow. The rewards—both professional and financial—are substantial. If you feel you have the ability, write us. It could be the most important letter of your life.

GM positions now available in these fields:

MECHANICAL ENGINEERING • ELECTRICAL ENGINEERING
INDUSTRIAL ENGINEERING • METALLURGICAL ENGINEERING
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Cover

The tools of the designer and the engineer, the blueprints which translate their ideas into great steel mills, the raw materials and finished steel—these are the elements of this painting in which Stanley Meltzoff dramatizes America's ever-growing steel industry.

COURTESY UNITED ENGINEERS AND Constructors INC., PHILADELPHIA

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Page 4 THE ROSE TECHNIC
You are cordially invited to visit Rose Polytechnic Institute where you can earn a degree in:

CHEMICAL ENGINEERING
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MECHANICAL ENGINEERING
CIVIL ENGINEERING

The next freshman class will be admitted
September 8, 1958
Melvin Janes, a friendly, sandy-haired man in his early forties, may well be the world's only trackwalker with a doctor's degree.

Since 1953, Dr. Janes has trudged many a mile along railroad tracks from Maine to Texas. His mission: to check with his own eyes the killing power of a unique railroad-bed weed destroyer.

Weeds are a menace to railroad men. They are a fire hazard; wheels slip on them; they hold moisture which rots the ties and undermines the roadbed; they make maintenance difficult. More than 50 kinds of weeds grow along the tracks. Some die easily and stay dead—but many are too tough for ordinary weed killers.

When Mobil scientists developed a promising new oil-based killer—AGRONYL R—Dr. Janes took to the tracks to check it out. It killed the weeds, all of them. Moreover, it's heavy and doesn't blow on to adjacent farmland. It leaves a film that discourages new growth (and also helps keep the tracks from rusting).

Chemical research is only one of many professions represented on the world-wide roster of Mobil personnel. We also employ nuclear physicists, geologists, mathematicians, engineers of every type, marketing analysts, marketers . . . people prepared to handle more than 100 different positions.

If you qualify, the Mobil companies offer you an opportunity to build a career through training that will utilize your talents to the fullest . . . constantly challenge your ingenuity . . . reward you with a lifetime of richly satisfying work.

For more information about your opportunity with the world's most experienced oil company, see your College Placement Officer.
QUICK QUIZ FOR ENGINEERS

ARE YOU THE "IMPOSSIBLE" TYPE?

YES □  NO □

If your answer is yes, you're a Detroit Edison engineering type. The kind who'll tackle an impossible problem—and lick it. You're not afraid to have a new idea. You're the kind of young engineer who works hard at finding faster, more efficient, more economical ways.

In short, you're the inquisitive, exploration-minded sort of engineer Detroit Edison is looking for. At Edison, your assignments will be liberally sprinkled with exciting challenges to your training and ability. And creative engineering is called for even on ordinary jobs.

You'll enjoy a big helping of prestige when you're associated with Detroit Edison, too. It's one of the Midwest's best-known, best-liked, most progressive public utility companies, noted for its pioneering accomplishments and leadership in America's business enterprise system. For some outside evidence of Edison's reputation, take a look at the March 25, 1957 issue of Electrical World. It contains eight pages, by some of America's leading electrical equipment manufacturers, devoted to recent engineering accomplishments in Detroit. They emphasize the important contributions Detroit Edison engineers make and will continue to make to equipment and systems engineering and design.

Think we're stretching our story a bit? Here's your chance to find out. Drop us a note and we'll send you a copy of "Detroit Edison Engineering"—it tells about the challenges and opportunities waiting for you. Write to the Employment Department, Detroit Edison, Detroit 26, Michigan. Or check with our representative when he visits your campus.

DETROIT EDISON
Editors of Tomorrow

Today, throughout the nation, there is a recognized need for engineers. The Soviet Union's recent venture into outer space has made the people of the United States realize that the leaders of tomorrow are the engineering students of today.

The scientist-engineer from now on must be a broad minded, liberally educated person, capable of evaluating the perplexities of society as well as those of nature, of providing the leadership of ideas without which there is no significant progress. Society needs not only highly qualified engineers but engineers of high standards and capabilities of all kinds.

A minimum of one hundred and forty-six credit hours are required for the degree of Bachelor of Science here at ROSE. Out of these only four electives amounting to between eight and twelve credit hours can be used over a period of four years to diversify an engineering student's education. This same situation exists throughout the nation.

How then are we engineering students to acquire the capabilities desired? We must acknowledge the goal that has been set for us and we must meet this goal by developing incentive and initiative to learn after we have graduated from the initial phase of our college careers. For those who have the inclination and ability, graduate, post-graduate education, and research replenish our supply of fundamental knowledge.

Increasingly, engineers are engaged in high level business management, and in determining public policy in local, national, and international affairs. Thus, the future of engineering is in the pursuit of creative ideas. These ideas do not come from the masses but rather from a qualified few. An engineer has the invaluable opportunity to become one of these select few.

V.W.I.

Shown at left is one of the twenty-four centrifugal fans installed in the new tube of the Lincoln Tunnel in New York City. The units range in capacity from 126,000 to 320,000 cubic feet per second. The fans were manufactured by the Westinghouse Electric Corporation at Hyde Park, Mass.

November, 1957
INDIANAPOLIS, IND.: (Special) Hundreds of engineers and technicians, applying their academic training first hand, have designed, developed and produced the Allison Model 501 Prop-jet engine and Aeroproducts Turbo-propeller (above) shown in a test cell at the mammoth Allison plants in Indianapolis. These General Motors experts have produced an engine which develops nearly 2.3-horsepower per pound of engine weight. Already in use with Air Force Troop Carrier Wings in the U. S. and abroad, Allison Prop-jet engines and Aeroproducts Turbo-propellers will power America's first Prop-jet commercial airliner, the ultra-modern Lockheed Electra.

Working shoulder to shoulder with propulsion system experts, newly graduated engineers are assuring their futures by carving a niche for themselves on the General Motors team of today. If you would like to know more about this team, write Personnel Department, College Relations, Allison Division of General Motors Corporation, Indianapolis, Indiana.
Career opportunities at Du Pont are greater today than ever before because of the Company's continued growth. In 1957, Du Pont's sales were at the $2 billion level. Four new plants were being built. New research programs were being launched, and new products were moving into the production and marketing stages. All of these developments tended to broaden opportunities at Du Pont for the young scientist and engineer.

**ALL KINDS OF ENGINEERS**

Students with chemical engineering and chemistry degrees are needed, of course. But the opportunities are equally great for students majoring in many other fields. And the type of work for these men varies greatly. Among other things:

- **Mechanical engineers** work in research and development as well as in plant engineering and production supervision.
- **Metallurgical engineers** conduct studies in metal fatigue and corrosion and engage in fundamental research into the nature and properties of elements.
- **Civil engineers** have many assignments, including design and supervision of the construction of Du Pont plants and laboratories.
- Men studying for degrees in electrical, mining, petroleum, industrial and many other specialized fields of engineering will find equally challenging outlets for their talents at Du Pont.

If you’re interested in finding full scope for your ability, Du Pont offers you plenty of opportunity.

**Du Pont Training Tailored to Individual**

Each of Du Pont’s operating departments has its own training program because each has special requirements. But both formal and informal programs are tailored to the interests and needs of the individual.

Generally, you go to work on an assignment at once and start learning right away. This head start on responsibility is an important factor in your progress. Based on your qualifications, you’re given one segment of a project to tackle almost immediately. You learn quickly and informally in consultation with your supervisor and other engineers on the same project. This training is supplemented by frequent meetings, seminars, studies of plant operations and procedures.

And since Du Pont is interested in the progress of the individual, your performance is evaluated at regular intervals by your supervisor. These discussions bring out your strong and weak points and together you work out a program for improvement. This training and evaluation continues year after year as you advance in the Company.

**SEND FOR INFORMATION BOOKLET**

Booklets on jobs at Du Pont are yours for the asking. Subjects include: mechanical, civil, metallurgical, chemical, electrical, instrumentation and industrial engineers at Du Pont; atomic energy, technical sales, research and development. Name the subject that interests you in a letter to Du Pont, 2494-B Nemours Building, Wilmington 98, Del.
At the present time the St. Lawrence Seaway project is approximately following the construction schedule originally established for the job. This schedule has been designed to allow opening of the Great Lakes' “Gateway to the Sea” sometime in April, 1959. There is still speculation as to whether or not the project will have reached completion by this date, but at this moment a triumphant end is in sight.

There are still several problems to be contended with, however, which are not directly concerned with the actual construction. One of these is a battle going on between the United States Army Corps of Engineers and the St. Lawrence Seaway Corporation over the Operation of the Seaway.

The Corps of Engineers is asking the Seaway Corp. for an operating contract on the basis of a 100-year-old law which gives the Army Engineers control of maintenance and operation of all U. S. inland waterways. The Army also contends that its experienced staff could operate at a lower cost than the Seaway Corp. could. The Seaway Corp., on the other hand, has no desire to place the Seaway under Defense Department domination and is making plans to hire its own operating staff. The Seaway Corp. makes its stand on the “1954 Seaway Act” which gives it power to build, operate, and maintain the waterway, and maintains that its own staff could operate with less overhead.

With the decision such an important one, it is possible that this control fight could end up in a long battle in the courts. This is a typical example of several problems which must still be dealt with.

The biggest question in many people’s minds, however, is about whether or not the expenditure of increasing amounts of money, needed to keep even with the tremendously rising construction costs of the project, is to be justifiable in the end result. There is much reason for concern that we may be “going in over our heads” financially in this matter.

This is a question for which there can be no answer until the Seaway is actually put into operation. Work is too far along and too much money is already involved to offer any alternative but to go ahead until the project is completed. This will mean the expenditure of many more millions of dollars than was estimated when the project was started in 1954.

To be more specific, here are some of the facts and figures pertaining to the financial status of the Seaway. The original estimates, which were given when Congress authorized the Seaway in 1954, gave the U.S. share of the project at $96 million. At present, estimates of the amount of money which the U.S. will have poured into the Seaway before it is completed range upwards of $143 million. This is an increase of over fifty per cent of the original estimate. This percentage increase in estimated cost is closely matched by Canada’s increased cost estimates. Her original estimates were for a cost of $192 million, or twice the U.S. estimate, but these estimates have grown to $305 million.

In addition to the increase in construction costs, it is now realized that operating costs will be far above the 1954 estimate. The U.S. share of this cost will probably be around $8 million and the Canadian share will be approximately $16.2 million. These figures are in contrast to 1954 estimates of $5.8 million and $11 million respectively.

Reasons given for these tremendous increases are inflation, which is being felt in the construction business all over both countries, additions to the original plans, and changes in basic designs.

The inflation factor in these increases is actually a result of the Seaway itself. Along with the Seaway construction, additional construction of such facilities as new factories, piers, warehouses, and power plants is also being done. The construction “boom” thus caused has accounted for an estimated $19.3 million of the total increased construction costs.

In addition to these inflation increases are the costs of changes in (basic) designs. Costs of these changes have amounted to over $15 million. Some of these changes have resulted in lowering of construction costs, however, so that the overall cost of redesigning should only come to around $10 million.

The third category of changes in
cost has to do with additions to the original plans. Some of these additions have been made necessary when outside agencies, which were originally supposed to take care of some of the dredging and construction, have failed to see fit to do so. This has necessitated additional expenditure by the Seaway Corp. where the work had to be done as part of the other construction. The major part of these additions, however, were made necessary by the fact that several necessary items were omitted from the original plans. These items include building of a concrete testing station and a Seaway administration building, refinement in plans for the Long Sault canal, and the cost of getting a crew ready to operate the Seaway. This amounts to an increase of over $37 million. To soften this, the U.S. has omitted one lock and canal, which were to cost $21.2 million, from the plans. Ships which would have used this lock will have to use the Canadian facilities instead. Thus the U.S. is going to get less Seaway for more money.

With all these additional expenditures, there is speculation as to whether or not the Seaway will be able to pay off the debt incurred in construction in the originally planned period of fifty years. It is feared that the tolls which will now have to be charged will be sufficiently high to make use of the Seaway uneconomical. A general feeling of optimism is apparent here, though. This is due to the feeling that the original toll rate estimated was sufficiently low to allow an increase and still have the Seaway become the most economical mode of transportation. It is also noted that the rates of other forms of transportation are going up at the same time.

Now here is a short glimpse at several of the Great Lakes ports the Seaway will serve, including Buffalo, Cleveland, Detroit, Milwaukee, and Chicago. The Seaway will undoubtedly be of great importance to them, and through them, to the whole nation.

Buffalo, on the north-east end on Lake Erie, at the present time is the largest grain milling center in the world and is the Nation’s sixth largest steel center. She is also a great land transportation center, being second only to Chicago as a railroad hub and lying within overnight trucking distance of sixty per cent of the population of the U.S. and Canada.

She expects great things of her new Seaway business. With all of her land transportation facilities to distribute goods, Buffalo can expect a large amount of the new general cargo trade. She also expects to grab a large part of the new steel business created, because of her position half-way between the Mesabi range’s taconite ore and the rich Laborador ore deposits. This growth in steel business should also open the way for other new industry connected with steel.

Buffalo is counting on the Seaway to open her up to the world and make her even greater.

Cleveland, Buffalo’s Lake Erie neighbor, has been interested in a seaway project for many years having felt certain that it would eventually come. She is already assured of a good general cargo trade since several companies, such as Goodyear Tire and Rubber Company and the General Motors Euclid Division, are now using, or preparing to use, the Seaway for transporting goods out of the northern Ohio area.

Detroit is being very careful not to be over-optimistic about how much it will benefit from the Seaway and she is building her port rather carefully, through private enterprise. She expects most of her business to be in the general cargo field, with exports of food, furniture, chemicals, farm machinery, and automobiles. In fact it is estimated that about eighty per cent of our overseas automobile trade will be done through the Seaway when it is opened. Her port commission expects an average of one million tons of general cargo business by 1965 as compared with 97,000 tons in 1956. Thus Detroit should benefit greatly from the new waterway, too.

Milwaukee is the Great Lakes port probably best prepared for the Seaway. She took advantage of low building costs during the depression and now has a port which is ready for the increased trade as soon as the boats can get into Lake Michigan. Although the people of Milwaukee realize that Chicago will will probably eventually become the largest Great Lakes port, they are ready to “clean up” early on this new trade.

Milwaukee also expects her largest business in the general cargo trade, Automobiles, cowhides, and beer will take the place of steel, newsprint, French wines, foreign cars, and Holland’s Heineken’s Brew in the holds of the ships which load and unload there.

Chicago is the port which should benefit most from the Seaway because of her geographical location between Lake Michigan and the Mississippi River. She is an even larger land transportation center than Buffalo, being the world’s largest railroad center and the nation’s largest trucking center. Her port has many shortcomings, but she is presently embarking on a $125 million port development program which should help her on the way to becoming the principal inland ocean port.

Her principal interest will also be in the general cargo field but her bulk cargo business will also be very important. It is estimated that she will handle over one-third of the predicted $55 million foreign trade each year. This would increase her population by about two million people. Thus Seaway commerce could make Chicago the largest city in the country.

To these ports it appears that the Seaway will undoubtedly mean a great deal of economic growth. Whether the benefits which will be derived from the new waterway will justify its construction or not will only be known after it has been in operation for several years. Regardless of how large the benefit might be, cost of this project should stand as a warning to us not to undertake such ventures until we are sure of the work and money involved.
Locker Rumors

By John C. Fenoglio, jr., ch.e. and Elwood Stroupe, soph., ch.e.

Rose has almost completed one of the best years in football it has known in a long time. This year's team is really something for the student body to be proud of, for they not only have outscored our opponents 226 to 70, but they have in their captain, Carl "Rocky" Herakovich, the state's leading collegiate scorer. This year's team is worth the support of all the student body and alumni.

Coach Phil Brown had Rose's spirit built up to its maximum for the Homecoming game and the Engineers thoroughly trounced the Grizzlies from Franklin. The scoring was well divided among the backs with Drisner, Longfellow, Hallcom, Anderson, Michaels, and Herakovich scoring. Godwin kicked 5 PAT's and a safety scored by the entire line rounded out the scoring. The capacity crowd at the game was the largest ever to crowd into Lost Creek Stadium. The crowd helped the spirit of the game to remain at the high level that it should. With several persons, including the alumni, leading the cheering the crowd really got the spirit of the occasion and from all reports this was the best all-around Homecoming in many a year.

Just a short three days following the Homecoming game, Rose journeyed to Eureka College. Still riding high from their win over Franklin, they defeated the Eureka grid-ders 27-0. This game proved to be a picnic for Captain Herakovich as he ran wild, scoring all four touchdowns against the opponents. This game was played during the week because the original date was postponed due to a bad flu outbreak among the Eureka squad.

Rose came into the final road trip of the season with everything riding on the outburst of the game. If they won, they would be undisputed champions of the Prairie College Conference. If they lost, they would have the embarrassment of sharing the Championship with Eureka, who they had beaten 27-0. This was the final game of the season for Principia and no matter how the game turned out they would finish in last place in the Conference. Although the breaks of the game were against them. They fumbled ten times during the game but still won. Kurtz, Hallcom, and Drisner racked up the tallies for Rose with Godwin coming through for the all important extra points. He missed only one out of three after having the ball moved back 5 yards due to a penalty for delay of the game. Although the score wasn't what they would have liked it to have been, the important thing was that they were Conference champions! Soon there will be a very handsome trophy to grace the Fieldhouse trophy case. The team is very proud of this trophy for it represents many long hours spent in practice in cold, wet weather outdoors and in the hard and dirty sawdust of the fieldhouse, as well as the long, tiring bus rides of the road trips. But it was worth it!

The Prairie College Conference ended up like this:

<table>
<thead>
<tr>
<th>Team</th>
<th>Wins</th>
<th>Losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rose</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Eureka</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Illinois</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Principia</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Rose's next home game will be against Earlham on Nov. 16. The team hopes to finish the season with a 7-1 record. Let's all hope they do!

VARSITY BASKETBALL:

With the '57-'58 basketball season drawing near Jim Carr's boys are beginning to shape up. With only one senior and one junior on the squad this might turn out to be a building year for RPI. The loss of several men has left holes in the starting lineup. The job of filling these will go to sophomores with little experience or freshmen with no college experience.

Returning lettermen are: Gary Giffel, Larry Grimes, Sherm Smith, Jim Sargent, Larry Berger, Jim Gregggs and Woody Stroupe. As usual freshmen will provide reserve strength and probably a few starters. Mike Smith, Don Dekker, John Ray and John Tindall are four of the freshmen who are expected to see a lot of action.

(Continued on Page 39)
After spending twenty or thirty minutes in the Rose Poly east parking lot each morning for several days, one soon begins to recognize several different types of parkers, three of which are the more prominent, and which, for the sake of convenience, we shall designate as the overly-cautious type, the I-know-I’ll-get-out-first-today type, and the bar-bender type (More affectionately referred to as the hit-and-shudder group).

The first of these three license bureau prodigies, the overly-cautious type, usually falls into one of three categories. The first of this aggregation is the fellow who has just bought or has been given a late model car. He is so nauseatingly proud of his infant of modern engineering that the thought of his bumper so much as even touching the dividing bar brings on a state of sheer hidrosis to his brow. He therefore manages to position his new automobile a ‘safe distance’ from the bar, his definition of ‘safe distance’ being four to six feet.

The second of the overly-cautious type is the fellow who, for one reason or the other, is driving his parents’ car, and who has been told most emphatically that if there was so much as even one little itty-bitty, tinny-winnny, little scratch on the automobile when he returned that evening he would never pilot the family car again—ever! Being thoroughly scared out of his somewhat narrow wits he is usually a nervous wreck by evening after running out to check the car an uncountable number of times over the course of the day. He of course parks a highly impractical distance from the dividing bar (for ‘safety’s’ sake) also.

The third and last of the safety socialites is the character who just can’t judge distance. It may be noted here that this type can often overlap into the preceding two categories. He comes several minutes early each morning in order to be finished parking by the time his first class starts (And at that he doesn’t always make it), and it is not an unfamiliar sight to see his best friend standing outside the automobile motioning violently with his appendages, both arms and legs, in an useless effort to guide his frantic little friend into place. This is a complete farce because our hopeless (or should that be hapless)? hero refuses to have any faith whatsoever in his crony’s labors and ends up with enough space between his bumper and the bar to harbor the whole Rose regiment.

The overly-cautious type is probably the most irritating of all parkers, for in their long-distance efforts to angle into place they constantly succeed in blocking the lane of traffic. It is interesting and rather ironic to note that in their efforts to save their cars from being dented, this ill-fated little group usually ends up having their cars scraped by some poor innocent by-stander (Or rather by-sitter) who is trying vainly to maneuver around their protruding vehicles.

The second perdominant type of parker, the I-know-I’ll-get-out-first-today-type, is obsessed with the idea that some unknown terror will grasp him at the end of the day if he isn’t the very first one out of the parking lot, and for that reason he parks his car backwards front heading out. There are several theories concerning the reason for this phobia. One of these theories expresses the belief that this type comes from a large family and being the last to arise (naturally) always ends up being the last to use the bathroom in the morning. Another theory puts forth the possibility that perhaps our young friend is secretly practicing for the LeMans sports car race. However, the most probable theory is that this poor fellow just hasn’t yet discovered the locations of the men’s rest rooms on the Rose campus.

It is only fair to note that there are two types which fall into this category which are not possessed with this uncontrollable urge to get out ahead of the others. The first of these is the easy-going (lazy) type of fellow who simply prefers to get the bother of turning his car around over with early in the day, thus saving the trouble of doing so later.

(Continued on Page 40)
Fraternity Notes

ALPHA TAU OMEGA

Well, the Taus have done it again—won the Homecoming Display contest that is. The big trophy still resides in its place over our mantle. Many hours of work went into this year's display, and we were very proud of it. Completing the display required several work sessions, and took up two weekends completely. Brothers Tom "Blivet" Reese and "Gink" Grimshaw literally became sick over the whole thing. They were both laid up a few days due to colds and flu acquired while out working on the display. However, a highly successful party at the house was a temporary cure-all for these and other Brothers and alumni.

Just a few weeks ago, the sophomores completed their pledge project, begun last spring. They reversed the room in the basement which has variously been known as the rumpus room, "pink" room and any other kind of room. They put in a new ceiling, removed an ugly undergrowth of plumbing, patched the plaster, and repainted the entire room a rose color. The room is fast coming to be called the Rose Room. Thanks, neophytes. The room is now adequate for meetings of the "euchre club," and other sociable activities.

Another new event at Gamma Gamma this past month was the birth of an alumni newsletter, The Rose Tau. This newsletter is to be published three times each year. Its purpose is to draw our alumni closer together by giving them news of the active chapter and of each other.

The Taus are presently looking forward to a full social calendar. There will be a party prior to the Military Ball on Nov. 16th. The VMI dance with Sigma Nu is December 6. There will be a Christmas party for the children at Glenn Home Sunday, December 15. The Delta Gamma's from Indiana State will help us with this project.

If the present trend keeps up Alpha Tau Omega will shortly be a pinless fraternity. Four more brothers have recently entrusted their pins to the care of some young lady. Bob Sutton pinned Nancy Lyon, Bill Kuchar pinned Barbara Busch, Al Crumbaker pinned Jane Warner, and Chuck Sechrest pinned Donna Schmidt.

Under the coordination of Brother Bronnert our freshman "get acquainted" parties were a huge success and proved entertaining to both freshmen and members. Our Mother's Club prepared and served refreshments that were highly praised by all.

Bob Hall

LAMBDA CHI ALPHA

It's official now, Brother Hildenbrand is pinned. He gave his pin to Miss Margaret Parke of Indianapolis just two days after I wrote my copy in which a hint was dropped. Congratulations also to our new pledge sophomore John Witcher. Johnny is from Shoals, Indiana, the hometown of Dick Kirby.

Lambda Chi became the first recipient of the traveling I-F council scholarship trophy, presented at the Honors Assembly, October 10. Also at that time President Dan Mook was tapped for Blue Key and I was tapped for Tau Beta Pi.

A mixer is planned for November 8, with the student nurses of Union Hospital. However if everyone keeps getting pinned, the attendance will drop off.

The freshman get-acquainted parties were held recently with great enjoyment for all, especially for the actives who rated two pieces of pumpkin pie. Five Delta Gamma's from Indiana State provided some very attractive scenery besides serving the refreshments.

Jim Barrick

SIGMA NU

Now that school has hit us all right square in the face, it's time to stop and take a good peek in the A' Snake Pit to see just what is (Continued on Page 43)
In the last 200 years man has advanced more rapidly in technical development than the preceding 2,000. For this progress we must thank the “Seven-League Boots” of power.

It took thousands of men generations to build the great pyramids of Egypt. Today, with the help of modern machinery, a few hundred men could complete them in a few months. The difference in time consumed lies in the application of power.

Just what is power? The words “work,” “energy,” and “power” are used loosely in common speech, but to the engineer each has a distinct meaning. Work means the overcoming of resistance; energy is the capacity for doing work; but power implies the capacity for doing work at a given rate of speed.

Man’s first sources of power was, of course, his own muscles. But hundreds of centuries ago he learned to supplement his efforts with those of domesticated animals. Most useful of all, because of its strength, speed, and ease of handling, was the horse. For ages the amount of work a man could do depended on the power of the horses available to him. And ever since then power has been measured in terms of the work a horse could do. One horsepower is the power required to raise 33,000 pounds one foot in one minute.

Perhaps the first application of power from non-living forces of nature came when men hoisted sails over their boats to harness the wind.

Water power was the only other type of power used by early civilizations. The Egyptians set up simple wheels to raise the water of the Nile for irrigation.

The first big step of the development of power was the invention of the modern steam engine by James Watt. This power source revolutionized the economy of the world. It changed men from small farmers to giant industrialists. Yet all this power that drives our mills, factories, and engines comes from the simplest thing on the earth—a drop of water.

This is a very fine invention, but men needed a way to transfer power from one area to another. That need developed into the greatest contribution of science to mankind, the electric generator. The generator takes the power developed by water power or the steam engine and turns it into electricity. The electricity is sent to a motor in a place, far from the natural resources needed for other sources of power; therefore making it economical to product goods where the market is concentrated. It is through electricity that our homes can be as comfortable as they are today.

The stationary engines can not be beat when the power requirement is concentrated at one point. Yet there are many uses to which an engine can be applied that only require a small amount of power. These smaller engines usually must feature a large amount of mobility. The internal combustion engine was the answer to this problem. The gas engine is compact, light, and capable of very high speeds. It is economical, simple in construction, and easy to operate. The internal combustion engine in the automobile alone contributes 4/5 of the total capacity for all the power plants in the United States. So you can see the gasoline engine has had far reaching effects on the transportation industry.

Estimated World Reserves of Fuel Energy

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<th>BTU</th>
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</thead>
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</tr>
<tr>
<td>Natural gas</td>
<td>$1 \times 10^{18}$</td>
</tr>
<tr>
<td>Coal</td>
<td>$72 \times 10^{18}$</td>
</tr>
<tr>
<td>Fission</td>
<td>$1770 \times 10^{18}$</td>
</tr>
<tr>
<td>Fusion</td>
<td>NO LIMIT</td>
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</tbody>
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Estimated World Reserves of Fuel Energy
Three recent convocations held in the Rose Auditorium have proved beneficial and enjoyable to students and faculty.

On October 24, Mr. Zader, placement director, presented a program in connection with the upcoming campus interviews. A panel consisting of Professors Bankoff, Moench, Hooper, and MacLean discussed interviewing problems and answered many individual questions concerning the subject. The program served to help prepare all men who will be taking interviews and brought out may good suggestions.

Interview Techniques was the subject of the talk given by Mr. Larry Nuss of Collins Radio Company on October 31. Mr. Nuss is director of recruiting for Collins and has had wide experience in the field of interviewing. His talk was of an informal nature and a question period followed during which many helpful suggestions were brought forth. Mr. Nuss, in his talk, stressed preparedness, self analysis, and humility as the most important assets in taking interviews. His comments were reassuring to the men present and the program was highly beneficial to all.

The Indiana University Philharmonic Orchestra, under the direction of Tibor Kozma, presented a concert in the Rose Auditorium Thursday, November 7. The program consisted of Symphony Number 102, by Haydn, Vienna Blood, a Viennese waltz by Johann Strauss, and a presentation entitled "A Young Person's Guide To The Orchestra," narrated by William Appel. The orchestra gave a superb performance showing good versatility and the program was greatly enjoyed by all present. Many guests were in attendance and the auditorium was filled to near capacity.

On Friday night, October 11, the Campus Club held a mixer with girls from ISTC Women’s Residence Hall in the student center. Music for dancing was provided through a high fidelity system and our own swing band. Magician Jim Montgomery showed us that he was still in practice; he had even learned a couple of new tricks. Halloween was the theme of the evening and the center was decorated for the occasion complete with corn stalks and pumpkins. We sure enjoyed having you, girls; hope you had a good time and can return.

Both dormitories were open to visitors on Homecoming Saturday. Our living quarters drew many fine comments from parents and friends of students.

ALUMNI NEWS

'24 Edward J. Hauer, c.e., has accepted a position as a project engineer with the Olin-Mathieson Company. For the last 6 years, Mr. Hauer has been senior engineer for Liberty Powder Co., Newport, Indiana.

'31 Harry J. Loving, ch.e., is Products Control Chief of Mennel Milling Co. of Fostoria, Ohio. Mr. Armstrong was formerly Technical Assistant, Bakery Sales Division, Pillsbury Mills, Inc.

'44 Luis Bogran, e.e., since the first of this year has been Managing Director of the "Empresa Nacional de Energia Electrica," an autonomous organization in charge of all the Central Government owned electrical projects throughout Honduras, C. A.

'49 Nelson Havill, e.e., has been promoted from field sales manager to general sales manager for Potter and Brumfield, Inc. Prior to joining Potter and Brumfield, Mr. Havill was manager of the Highway Machine Co. in Princeton, after having been employed by P. R. Mallory and Co. and the Century Tire Co., both in Indianapolis.

'55 Bill Johnson, e.e., is a platoon leader in a Panel Bridge Company stationed in Schwetzingen, Germany. In August, 1957, Mr. Johnson plans to return to the Electrical Controls Group at Delco Products Division of General Motors in Dayton, Ohio.

'55 Richard A. Bosshardt has been promoted to first lieutenant at Fort Belvoir, Virginia. The lieutenant was previously employed by the Procter and Gamble Company, Cincinnati, Ohio.

'57 Marc Broemmelsick, e.e., and Harry McGuire, e.e., have both recently joined the Bendix Products Division of Bendix Aviation Corporation at South Bend, Indiana. Mr. Broemmelsick has joined the Fuel Meters engineering staff, and Mr. McGuire is with the Guided Missiles engineering staff. Both of these men will be participating in a $90 million-year engineering program which includes a technical staff of more than 10,000 in all divisions of Bendix. The program includes new developments in such fields as: aviation, electronics, guided missiles, aviation and automotive components, television and many others.

Richard Carter

THE ROSE TECHNIC
Got Any Problems...?

RPI’s Amazing Transportation System by Tau Beta Pi Pledge Class Spring of 1957

This transportation system came out of the necessity to eliminate traffic hazards which includes parking lots, mudholes, noisy cars and other crudities involved in surface transportation. This we feel, will help to lower the attrition rate by eliminating the frustration and aggravation connected with transportation to and from school.

This system was born out of two great improvements needed by the fair city of Terre Haute:

1. A 220 ft. waterfall in the Wabash river to provide hydro-electric power for Terre Haute and the surrounding vicinity. This has other useful features because it will attract tourists. The Chamber of Commerce hopes to make Terre Haute a haven for honeymooners and go into competition with Niagara Falls.

2. A bill has been passed by the City Council for the construction of a completely new sewer system to eliminate the inherent drainage problem in Terre Haute. These sewers will be 6 ft. in diameter and there will be one under every street in the city.

By taking advantage of these two improvements, an ingenius method of fast, efficient, sub-surface transportation has been devised. After much consultation with Mayor Tucker, we convinced him that the two improvements needed a few small additions; these additions will do much to help relieve traffic congestion and to save wear and tear on city streets.

The first addition will be an extension of the Wabash Avenue sewer to run all the way out to Rose Poly’s main building. Also, a sewer line will be run from the waterfall to the RPI main building and there make a junction with the Wabash Avenue extension.

It will be economically feasible to do this because of a cooperative plan worked out between city officials and the RPI engineers. This plan involves utilization of the waste heat from local industries. This heat can be utilized by catching the industrial sewage and running it through copper tubes in the sewers. These copper tubes will then be used as heating coils in Terre Haute homes. This will eliminate deficit financing.

The transportation system will be constructed and operated in the following fashion:

The waterfall will make its 220 ft. fall through a specially-constructed huge plastic pipe. The sewer line will run from the main building to a selected point in the tube. This will cause a large pressure drop in the sewer by the principle used in an aspirator. This will provide a large enough pressure drop to cause all the sewage to be sucked out to Rose Poly. By enclosing students, faculty, and other members of the staff in large, plastic bags they can be transported to school by floating on the sewage moving out to RPI. This will necessitate construction of a large storage tank to store the sewage during the day. Then when everybody is ready to go home at 4:00 o’clock, the sewage will be allowed to run back to Terre Haute, carrying the students, faculty, etc., back in their plastic bags.

By using the sewer system for transportation routes, nobody will have to walk over 100 ft. to get to a manhole for the ride out to Rose every morning. During this period all sewer outlets to the Wabash river will be plugged so that there will be no leakage. (Everyone will be cautioned to be sure their plastic bags are tightly zipped before they plunge into the sewer every morning.) Upon arrival at school everyone will flow to an air-lock constructed in the main hall. Here, after emerging from the air lock, each bag is immediately sprayed with a deodorizing shower.

Since there has always been a problem of faculty arriving late, the faculty will be given plastic bags that are aerodynamically designed. This will allow them to flow faster and keep them from getting caught in the debris. As a special priority, the faculty will be given a choice of bag colors to express their individuality.

On Friday evenings a special branch line will be opened to transport TGIF Club members to the “Rafters” without having to battle flow-line traffic.

There will also be branch lines provided from the dormitories to the main building for those students who do not wish to walk the distance to the main building.

(Continued on Page 39)
To while away my time for the past two summers, I have worked for the Indianapolis Power and Light Company. The first summer I worked on a line truck. The second found me working in various substations, of which there are two different types: underground and above-ground.

The underground substations are used in the downtown area while the aboveground stations are used in residential areas and heavy industrial areas. Although it is not standard in all cities, Indianapolis employs two different voltage circuits underground: 4.1KV and 13.2KV. The secondary voltage in either case is 105/210V. At present 4.1KV primary circuits are in the process of being standardized at 13.2KV. Some establishments in the downtown area have already started installation of 4.1KV air conditions, therefore, the Company will keep some 4.1KV circuits to be distributed only to the consumer. The rest of the load will be converted to the 13.2 KV primary voltage. The reason for using a higher voltage is that more power can be furnished the consumer with the same line current. In the future the voltage may again be raised as the loads increase, and more power can be consumed without changing the cables that are now in use. This will probably be the case since the load requirements have doubled every five years since 1940.

The primary cables are carried in cable runs called duct lines. Each duct line is tiled, and carries this cable to the vault from the primary power stations.

In the downtown area, each vault may have as many as six, or as few as one, three phase transformers. No matter what the number of transformers are in a vault, each transformer in the vault is on a different one of the eight primary circuits available. The transformer ratings vary from 100KVA to 1000KVA.

The primary cables coming into the vaults, go first into a primary switch. This switch is used as a disconnection for the transformers. The current then enters the transformers, each of which is connected in a delta to wye manner. This means the primary side of the transformers is connected in a delta and the secondary side is connected in a wye. On the secondary or wye side, the center of the wye is used a common or ground. When 110 volts are wanted the connection is made from one phase to ground. When 220 volts are wanted the connection is made between any two of the three phases. Beyond the secondary of the transformer, the current enters a device called a circuit protector. The purpose of this protector is to remove the transformer from the secondary circuit. The protector operation is automatic, and the rated closing time is five cycles. The only time the protector operates is when an overloaded condition exists. This condition would result from a direct short on the secondary of the transformer, or from an excessive demand. The

At the beginning of the article it was stated that there was another type of substation: above-ground. These are classified as 138KV substations, while some of the 34-5KV owned by heavy industry. These industries assume the cost of initial installation and maintenance.

In the 138KV substations there are, at present, two transformers banks and provisions for a third

(Continued on Page 46)
How does a chemist happen?

"New ideas," Henry Thoreau wrote, "come into the world... with a flash and an explosion and perhaps somebody's castle roof perforated." Many a budding young chemist has introduced his parents to chemistry in similar fashion. But the real making of a chemist takes place in quiet, unspectacular little ways.

There is the challenge of a teacher who asks two new questions for every one he answers.

There is the mental sweat and labor of working out a quantitative analysis—and the glowing pride of being right, to the fourth decimal place.

There is the romance of chemistry written wordlessly in the twinkle of an aging professor's eye.

There is memorizing and mixing... calculating and titrating and cramming. Hour upon unending hour of them.

But the hours, the days, the years of work and study silently dissolve in that magic moment when a new idea strikes... in that moment when all that has been done is forgotten, when all that seems important is to learn if this new thing that has never been done, can be done.

In that fleeting moment, the student becomes a scientist and begins for the first time to use chemistry to help people gain a little more comfort, a little extra convenience, a little better health.

It is many such moments that make a career in the chemical industry exciting, challenging, and very, very satisfying.

Write for a copy of our booklet which shows how you can achieve this type of satisfaction at Koppers. Koppers Company, Inc., Pittsburgh 19, Pennsylvania.
CAN YOU FIGURE IT OUT?

Re-arrange the numbers 1 to 49 so that all rows, horizontal and vertical, and the two major diagonals, add up to 175 each. It can be done!

1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31 32 33 34 35
36 37 38 39 40 41 42
43 44 45 46 47 48 49

Solution at bottom of page

FIGURING OUT A CAREER?

Selecting a career can be puzzling, too. Here's how Lee Baker found the solution to his career problem—with IBM:

Despite his impending Service hitch, Lee was hired by IBM in 1953. As a Technical Engineer, he entered the General Manufacturing Education Program, a 10-month course with rotating assignments in all phases of the work: manufacturing, purchasing, production. Then came two years in Korea. Now back at IBM, Lee has been promoted to Production Control Engineer, responsible for designing systems to insure a smooth flow of work through the IBM electronic computer plant. "It takes creative engineering ability to design these systems," says Lee, "and administrative ability to 'sell' a system to higher management."

* * *

There are many excellent opportunities for well-qualified engineers, physicists and mathematicians in IBM Research, Development and Manufacturing Engineering. Why not ask your College Placement Director when IBM will next interview on your campus? Or, for information about how your degree will fit you for an IBM career,

* SOLUTION

30 39 48 1 10 19 28
31 47 7 9 18 27 29
36 4 8 17 26 35 37
5 14 16 25 34 36 45
13 15 24 33 42 44 4
21 23 32 41 43 3 12
22 31 40 49 2 11 20

*Solution at bottom of page

Lee Baker tells what it's like to be...and why he likes being...a Manufacturing Engineer with IBM.

JUST WRITE TO:

Mr. R. A. Whitehorne
IBM Corp., Dept. 850
590 Madison Avenue
New York 22, N. Y.
How to engineer a career

Best career advice we know is to "make no little plans". If you're the kind who measures the outer dimensions of the future with the divider's legs standing in a giant stride, we think you'll be interested in the 3M Company.

This unusually fast-growing company encompasses a wide world of products and fields of interest that leave plenty of room for growth—yours and ours.

Take our measure... in terms that are vital to your career. 3M sales have more than doubled in the last five years. Fact is, more than 22% of the products now being sold by 3M were developed in the last five years... exciting products like "SCOTCH" Brand Magnetic Tapes to guide rockets and "THERMO-FAX" Brand Heat-activated Copying Machines.

Of course, 3M people are responsible for this growth... through new ideas and creative engineering. And it means that they are growing, too... in responsibilities, earnings, opportunities.

If we sound like your kind of company, write us now for full information. Minnesota Mining and Manufacturing Company, St. Paul 6, Minnesota.

"3M Company has traditionally reinvested approximately fifty percent of earnings in research and the capital investment required to produce and market the products of research."—3M Annual Report.
What's doing...

One indication of accomplishment in the combustion field: the J-57 engine, augmented by afterburner, provided the thrust which made supersonic flight practical for the first time.

This special periscope gives Pratt & Whitney Aircraft engineer a close-up view of combustion process actually taking place within the afterburner of an advanced jet engine on test. What the engineer observes is simultaneously recorded by a high-speed motion picture camera.
Historically, the process of combustion has excited man's insatiable hunger for knowledge. Since his most primitive attempts to make use of this phenomenon, he has found tremendous fascination in its potentials.

Perhaps at no time in history has that fascination been greater than it is today with respect to the use of combustion principles in the modern aircraft engine.

At Pratt & Whitney Aircraft, theorems of many sciences are being applied to the design and development of high heat release rate devices. In spite of the apparent simplicity of a combustion system, the bringing together of fuel and air in proper proportions, the ignition of the mixture, and the rapid mixing of burned and unburned gases involves a most complex series of interrelated events — events occurring simultaneously in time and space.

Although the combustion engineer draws on many fields of science (including thermodynamics, aerodynamics, fluid mechanics, heat transfer, applied mechanics, metallurgy and chemistry), the design of combustion systems has not yet been reduced to really scientific principles. Therefore, the highly successful performance of engines like the J-57, J-75 and others stands as a tribute to the vision, imagination and pioneering efforts of those at Pratt & Whitney Aircraft engaged in combustion work.

While combustion assignments, themselves, involve a diversity of engineering talent, the field is only one of a broadly diversified engineering program at Pratt & Whitney Aircraft. That program—with other far-reaching activities in the fields of instrumentation, materials problems, mechanical design and aerodynamics — spells out a gratifying future for many of today's engineering students.

Mounting an afterburner in a special high-altitude test chamber in P&W's Willgoos Turbine Laboratory permits study of a variety of combustion problems which may be encountered during later development stages.

Microflash photo illustrates one continuing problem: design and development of fuel injection systems which properly atomize and distribute under all flight conditions.

Pratt & Whitney Aircraft engineer manipulates probe in exit of two-dimensional research diffuser. Diffuser design for advanced power plants is one of many air flow problems that exist in combustion work.
Helmet for my Pillow by Robert Leckie

Helmet for my Pillow mirrors war with unusual insight and humanity. It records with freshness the memorable experience of men in war—not only the terrors and tensions of battle but the buffoonery and boredom in between.

Robert Leckie was a machine gunner and scout for the famous First Marine Division in the South Pacific during World War II. He enlisted immediately after Pearl Harbor; then came Paris Island and the metamorphosis from civilian to Marine.

The First Marines didn’t know they were headed for Guadalcanal and the first major land engagement against the Japanese. “Luckie” (too rebellious even for a Marine) and his pals withstood the shock of their first battle, and then overwhelmed Melbourne, Australia, in a wild spree of binges, love affairs and sojourns in the brig.

Returning to Pelelieu in New Britain, they knew what they were in for—the feeling that they were expendable, the terror of attack, the boredom of waiting. After two visits to the hospital because of malaria and battle fatigue, Luckie was once more on combat duty. This time, trapped in a pattern of Jap artillery fire, he felt the world about him shatter. In a state of severe shock, he was rescued by his buddies. And for him the war was over.

In Helmet for my Pillow the author views the terrible devastation of war with grief and rage, then with thoughtful perspective he sifts his experiences into proportion with the whole of life.

The American Past by Roger Butterfield

The American Past draws upon all of our vast pictorial treasures in telling the whole story of America. More than 1,000 pictures have been closely integrated with 135,000 words of text to create a continuously unfolding narrative of America, how it got started, what has happened to it along the way.

It is a story told primarily in terms of the people who took part in it. For example, we see Washington as a rising young military man who cracked nuts between his fingers, danced all night long to forget his troubles, and won the Revolution with no more than 8,000 well-trained soldiers under his command in any single battle.

There is President John Quincy Adams, who slipped down to the Potomac every morning between four and six o’clock, left his clothes under a tree, and plunged in naked for a quick dip. . . . General William Henry Harrison, who died a month after he entered the White House, deliriously begging for relief from the office-seekers who stuck their petitions into his very pants pockets. . . . Woodrow Wilson, who sat on a White House veranda one night in 1917, eating crackers and milk and picking out his war message to Congress on a portable typewriter.

The American Past tells, as has never been told before, the story of the United States; of its beginning as a struggling collection of infant states and its progress through wars and setbacks, depressions and booms, comedies and tragedies, political high jinks and serious purpose, to its present status as the greatest power in the world.

Rascals in Paradise by James A. Michener and A. Grove Day

Most people never get beyond the dream of a tropical paradise under swaying palms, where one’s slightest whim is gratified with no effort. But a few venturesome souls have set out to make their dreams come true. This book chronicles ten historical examples—from the 16th century down to the present—of nine men and one extraordinary woman, who sought fulfillment and profit in the broad Pacific.

These true tales of high adventure in the South Seas range from Peru to China, from Hawaii to New Zealand, and touch all the glamorous islands in between. The rascals, rogues and romanticists include a British Navy officer (a fresh look at Captain Bligh); an intrepid Spanish lady explorer; a Chinese-Japanese pirate, who makes Captain Kidd look like an amateur; an Australian wanderer who, the authors believe, has not been excelled in his writing about the Pacific; a French nobleman-swindler; an English privateerman who became an island chieftain; a slave-driving buccaneer (the notorious Bully Hayes); a politician who was one of the foremost confidence men in history; a contemporary painter (on velvet!) who became a problem to Tahiti; and a sympathetic Nantucket whaler. The colorful narratives—in which truth outdoes fiction—tell of daring and heroism, violence and chicanery in the endless quest for power and pleasure.
A Campus-to-Career Case History

"The future looks unlimited"

"I wanted a career that offered variety, opportunity and a chance to work with people," says Lewis William Post, C.E., Michigan State, 1950. "So I chose the telephone company.

"My initial training—two full years of it—probed every phase of company operations and acquainted me with all of the jobs in the Plant Department, where I was starting.

"Today, as Plant Engineer, I'm responsible for preventive maintenance of all field equipment, installation of new facilities for wire and cable, and I work with architects and builders on telephone needs in new buildings.

"Selling's part of my job, too. I sell ideas—like the wisdom of planning for telephone service when you're building. Recently I advised an architect and an owner on telephone wiring and outlets in a new $160,000 medical center. I enjoy getting in on the ground floor of such projects and making contributions both as a civil and a telephone engineer.

"In my area of Chicago there are 80,000 telephones, home and business. More are being added every day. There's expansion everywhere in the telephone business—all across the country. To me, the future looks unlimited."

Lew Post's career is with Illinois Bell Telephone Company. Many interesting career opportunities exist in other Bell Telephone Companies, Bell Telephone Laboratories, Western Electric and Sandia Corporation. Your placement officer can give you more information about them.

Bell Telephone System

NOVEMBER, 1957
MANEUVERABILITY

Have you ever had your inboard aground? If you have you know that the propeller and engine become useless. What can be done? Nothing!

However, Waste King Corporation has developed a new method of steering and propulsion which could easily make such situations almost hypothetical.

This right angle drive propulsion system combines the advantage of an inboard engine with those of a fully steerable outboard propellor. It replaces the conventional rudder system in current model landing craft with an inboard engine driving an outboard propellor, capable of rotating 360° or more without stopping. As can easily be seen this increases the coxswain's ability to maneuver in close quarters by providing complete craft control in all directions under the most adverse conditions.

This system also incorporates a new design principle which permits direct mechanical steering by elimination of the torque reaction of the propeller, and enables the craft to make maximum use of available engine power in any direction.

All of the propulsion machinery—including steering wheel, instruments, and engine control — are mounted on a single frame to simplify installation. There are no alignment problems between machinery and hull. The only connections required are battery cables and fuel lines.

The system, although being currently used by Navy vehicles, can and will be easily adaptable to harbor boats and other civilian craft requiring a high degree of maneuverability in close quarters.

INSTANT RADAR MAPS

Airplane pilots and navigators can now consult a map that is only twenty seconds old, made night or day in flight by radar. With a device called a radar strip recorder which presents a photograph of the ground beneath the airplane as seen by airborne eyes, pin point accuracy navigation is now possible.

Previously navigators and pilots have had to rely on memory or hasty notes and calculations taken from radar presentations in the air. The new automatic device requires no operator and combines electronics and photography in its operation. The airplane's exact position and true flight path is easily determined in flight without relying upon memory or radio equipment on the ground.

Initially designed for use with an airborne radar system, the strip recorder is adaptable to practically all types of airborne radar. In addition, the device is useful as a ground recorder of radar or telemeter information relayed from flying recorders of radar sets. In such uses, the strip recorder makes it a simple matter for ground controllers and observers to monitor the flight path of a missile or drone aircraft.

Instrumental in making the rapid strip recorder feasible is a unique process evolved by the manufacturers of the recorder, Hycon Mfg. Company, for developing high sensitivity film in only ten seconds. The process uses only one liquid bath, which functions at a high temperature to speed the photographic development. Liquid is literally wiped onto the 9-inch wide film in the radar strip recorder much the same as painting walls with a squeegee. The transparency which emanates from the monobath developer is then viewed directly on a translucent lighted screen about the size of a sheet of notebook paper. The recording and development process is continuous and the observer sees a slowly moving portion of a long strip of film which is automatically wound up on a roller in the machine. The roll of film is a permanent record which can be used for reference or later compared to other flight records.

High precision optics and advanced electronic techniques went into the development of the radar strip recorder. The optical system includes mechanical adjustments which enable the observer to manually correct the machine for airplane wind drift. This wind drift adjustment results in a rectilinear record which maps the ground accurately along perpendicular axes, regardless of wind conditions at high altitude. In addition, special electronic circuits built into the recorder automatically correct for distortions due to the altitude of the aircraft.

Working well day or night, above (Continued on Page 34)
You want a job

PLUS

... plus the chance to get ahead
... plus the chance for recognition
... plus the chance to keep learning

As a leader in many fields, Union Carbide offers a handsome assortment of plus factors with its jobs. It’s a top producer of petrochemicals—and U. S. output of petrochemicals has roughly doubled every five years since World War II. It’s a leading producer of oxygen—and new steelmaking methods use such vast quantities of oxygen that consumption in ’57 is expected to be double that of ’55. And these are only two of the expanding fields in which Union Carbide is a leader.

In terms of jobs with plus, this growth means Advancement with a capital “A.” As our markets expand, we need more people to handle the development, production, and sale of our products.

Representatives of Divisions of Union Carbide Corporation, listed below, will be interviewing on many campuses. Check your placement director, or write to the Division representative. For general information, write to V. O. Davis, 30 East 42nd Street, New York 17, New York.

BAKELITE COMPANY Plastics, including polyethylene, epoxy, fluorothene, vinyl, phenolic, and polystyrene. J. C. Older, River Road, Bound Brook, N. J.

ELECTRO METALLURGICAL COMPANY Over 100 ferro-alloys and alloying metals; titanium, calcium carbide, acetylene. C. R. Keeney, 137—47th St., Niagara Falls, N. Y.

HAYNES STELLITE COMPANY Special alloys to resist heat, abrasion, and corrosion; cast and wrought. L. E. Denny, 725 South Lindsay Street, Kokomo, Ind.

LINDE COMPANY Industrial gases, metalworking and treating equipment, synthetic gems, molecular sieve adsorbents. P. I. Emch, 30 East 42nd Street, New York 17, N. Y.

NATIONAL CARBON COMPANY Industrial carbon and graphite products. Prestone anti-freeze, EVEREADY flashlights and batteries. S. W. Orne, P. O. Box 6087, Cleveland, Ohio.

SILICONES DIVISION Silicones for electrical insulation, release agents, water repellents, etc.; silicone rubber. P. I. Emch, 30 East 42nd Street, New York 17, N. Y.

UNION CARBIDE CHEMICALS COMPANY Synthetic organic chemicals, resins, and fibers from natural gas, petroleum, and coal. W. C. Heidenreich, 30 East 42nd St., New York 17, N. Y.

UNION CARBIDE INTERNATIONAL COMPANY Markets UNION CARBIDE products and operates plants overseas. C. C. Scharf, 30 East 42nd Street, New York 17, N. Y.

UNION CARBIDE NUCLEAR COMPANY Operates Atomic Energy Commission facilities at Oak Ridge, Tenn., and Paducah, Ky. W. V. Hamilton, P. O. Box “P”, Oak Ridge, Tenn.

VISKING COMPANY A pioneer in packaging—producer of synthetic food casings and polyethylene film. Dr. A. L. Strand, 6733 West 65th Street, Chicago, Ill.
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WHERE TO, MR. ENGINEER?
RCA offers careers in research, development, design and manufacturing for engineers with Bachelor or advanced degrees in E.E., M.E. or Physics. For full information, write: Mr. R. Haklisch, Manager, College Relations, Radio Corporation of America, Camden 2, N. J.
"Here are some of the facts about Honeywell that have most interested the young engineering graduates we talk to."

**HONEYWELL IS A GROWTH COMPANY!**

A growth company is one in which men move ahead because of opportunity and challenge ... in which problems are turned into progress ... and employment, sales and income increase steadily.

Honeywell, world leader in automatic controls, is such a company. For the past 30 years, sales have doubled or tripled every five years ($1.1 million in 1926; $287.9 million in 1956.) Employment has increased from 720 to over 30,000 in the same period and net earnings have climbed from $.4 million to $22.5 million.

The future is even more challenging. Planned diversification puts Honeywell in such new fields as office and factory automation, process control, plastics, atomic energy, electronics, missiles and satellites.

Honeywell has the proven skills to design, engineer and build the equipment required by an increasingly automatic world and to sell its products profitably.

---

**Table:**

<table>
<thead>
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<th>Year</th>
<th>Sales ($000,000)</th>
<th>Net Earnings ($000,000)</th>
<th>Plant Space (Square Ft.)</th>
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**Honeywell's growth in sales!**

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<td>540*</td>
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<td>73*</td>
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<td>63</td>
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<td>17,301</td>
<td>57</td>
<td>13,052</td>
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</tbody>
</table>

**Honeywell's growth in people!**

---

Glenn Seidel, Vice President in Charge of Engineering, B.M.E. Minnesota '36
RESEARCH AND ENGINEERING ARE IMPORTANT AT HONEYWELL!

One indication of how important research, design-development and product engineering are to Honeywell’s continued growth is the fact that over half of Honeywell’s more than 12,000 products were not made by the company 5 years ago.

Some of the problems which Honeywell research and engineering have solved recently are: the development of variable inlet-air diffuser systems for jet engines, which adjust to the speed of the aircraft, allow such advanced planes as Convair’s B-58 to reach design speed; the production of the space reference system for the Earth Satellite Rocket; and the production of the Supervisory DataCenter* central control panel which enables one man in one location to read and control temperatures for even the largest building.

Major research programs now underway at Honeywell include: the development of new techniques and the discovery of new materials to overcome the problems of extremely high temperatures created by high-speed aircraft and guided missiles; the development of automatic control systems for industrial automation; the development of even more accurate navigation systems for aircraft and rockets which may be called upon for intercontinental and interplanetary travel.

HONEYWELL MEN ADVANCE RAPIDLY!

Naturally, in a company committed to growth, opportunities are numerous for the engineers and scientists who can contribute to that growth. And at Honeywell, other factors accelerate advancement.

Engineers predominate among our vice presidents, divisional executives and department managers. Attitudes and opinions of our scientists and engineers are understood and supported by management.

Honeywell is composed of small units working as a team. These units multiply opportunities for early managerial experience and lay the foundation for more important managerial assignments in future years.

HONEYWELL OFFERS MANY EXTRA BENEFITS!

Honeywell’s extra benefit program is one of the most liberal in industry. There’s free group life insurance . . . free accident and sickness insurance . . . free hospital insurance. You’ll find a generous policy on paid vacations and holidays and a modern retirement program paying lifetime benefits.

Whichever Honeywell division or location you choose, you’ll be assured of special training to help you advance in your career. This training includes regular on-the-job instruction, formal classes at the company and tuition-aid courses at nearby institutions.

HONEYWELL’S MAIN FIELDS AND LOCATIONS ARE:

- **Minneapolis**—Aeronautical, Ordnance and Heating and Air Conditioning Controls.
- **Philadelphia**—Industrial Instruments, Computers, Controls and Valves.
- **Wabash, Indiana**—Heating and Air Conditioning Control Dampers and Electronic Air Cleaners.
- **Denver**—Oscillographic and Photographic Equipment and Research.
- **St. Petersburg, Florida**—Inertial Guidance Systems.
- **Seattle, Washington**—Ordnance Controls, Missiles and marine research laboratory.
- **Monrovia, California**—Ordnance Controls and Missiles.
- **Los Angeles**—Aeronautical and Heating and Air Conditioning Controls.
- **Boston**—Industrial Instruments, Servo Components and Controls; Data Processing Systems.
- **Freeport, Illinois**—Precision Switches.
- **Chicago**—Heating and Air Conditioning Controls.
- **Hopkins, Minnesota**—Corporate Research Center.
- **Beltsville, Maryland**—Data Recording Systems.
- **Toronto, Canada**—Manufacture of complete line of company products.
- **International**—Manufacturing Plants in Newhouse, Scotland; Amiens, France; Frankfurt, Germany; Amsterdam, The Netherlands; and Tokyo, Japan. Plus 166 Sales and Service offices throughout the world.

HOW TO LEARN MORE ABOUT HONEYWELL!

A Honeywell representative can answer your questions and give you additional information about opportunities at Honeywell. Please consult your college placement office for the date of his next visit to your campus.

Meanwhile, you will want to read “Your Curve of Opportunity in Automatic Controls.” Write R. L. Michelson, Personnel Administrator, Dept. TC29D, Minneapolis-Honeywell Regulator Company, 2753 Fourth Avenue, South, Minneapolis 8, Minnesota.

* Engineering and Research Facilities
  • Sales and Service Offices
Research & Development

(Continued from Page 28)

clouds or in clear weather, the radar strip recorder promises to revolutionize air navigation by combining the accuracies of radar, the convenience and utility of photography and the speed of electronics.

ALLOYS OFFER SOLUTION TO HEAT BARRIER

Already, the aircraft industry has overcome two formidable barriers in its history of conquest of the air — the gravity barrier and the sound barrier. Work is now under way on a third — the heat barrier.

But just as the first two barriers were topped through patience and the resources of sciences, so also is the conquest of the heat barrier inevitable. That it is being surmounted is a tribute in part to the development of high-temperature magnesium-thorium alloys.

Two of these new high temperature sheet alloys seem certain to fill a critical void in the nation's defense needs. They can best be described this way: aluminum is satisfactory in the low temperature range, and while several metallic alloys resist high temperatures well, none but magnesium offers the weight savings so paramount to top performance. To put it another way, titanium and some stainless steel alloys are impervious to extremely high temperatures, but their relatively heavy weight is an impediment to maximum performance.

The virtue of the new magnesium-thorium alloys is that they combine a superior strength-to-weight ratio with excellent heat resistance. They are ideally suited to the "middle temperature range" of about 350-750 degrees encountered by most aircraft and missiles which fly at more than 1,000 but less than 2,200 miles per hour.

BLOWHARDS

New York City's third tube of the Lincoln Tunnel, dedicated on May 24, contains a ventilation system powerful enough to completely change the air every minute and a half. A strategic combination of 11 blower and 13 exhaust fans that range in capacity from 126,000 cubic feet of air per minute to 320,000 cubic feet will maintain a constant flow of fresh air, injecting it into the tube at roadbed level and exhausting it through openings above.

Installed by the Westinghouse Electric Corporation, these fans, all of the centrifugal type, are nonoverloading fans with backwardly inclined blades.

The 24 fans which ventilate the new tube, together with the 56 fans in the old tubes, are controlled from one central station. Spotted along the tube are devices to detect carbon monoxide concentrations. The position and density of these concentrations are transmitted to the operator at the control station, making it possible for him to adjust the various fans according to the need in individual areas.

Forty percent of the space in the third tube is occupied by ducts that carry fresh air into the tunnel and discharge used air from the roof of the ventilation buildings.

Since the new tube will carry only eastbound traffic, ventilation is more difficult due to the upgrade at the New York end where the vehicles emerge. Thirteen of the 24 fans are located in the ventilation building at the New York side and 11 are housed in a similar building on the opposite side.

Some of the fans are kept for emergency reserve and not operated under normal conditions. Fans are automatically operated at correct speeds for ventilation to insure that carbon monoxide content is kept well within safety limits. The distance between the ventilation shafts at either end of the river is 5,486 feet, and is expected to increase by at least 50 percent the capacity of the Lincoln Tunnel which carried a total of 21,600,00 vehicles last year.

PRECISION

Testing of materials will never become routine as long as new materials are developed and older ones are improved. This is particularly true in the case of alloys designed for 1200 and 1250 degrees Fahrenheit operating temperatures. Where do you find delicate instruments to measure physical properties of alloys at such temperatures? In some instances, the building of an instrument to do the job involves almost as much work as the development of the alloy itself.

One important metal property required is the variation in modulus of elasticity at elevated temperatures. Also vital is the degree of surface strains incurred by heat cycling.

To obtain this information, engineers of the Westinghouse Materials Engineering Department adapted for high-temperature service a standard optical gauge used for measuring strains at roof temperature.

The small instrument roughly 1½ inches long by ¾ inches wide by ⅛ inch high consists of a metal framework to hold two tiny mirrors, one stationary, the other movable. The mirrors are mounted on blocks of Refractaloy alloy, which have one knife edge that contacts the sample. In operation, the gauge is clamped to the metal surface, a beam of light is aimed at one mirror, reflected to the other mirror and then back to light source, where a scale indicates the angle of the return beam of light. When the sample is heated to test temperature, the movable knife-edge rotates slightly changing the mirror angle and in turn the light beam return angle. Since there is no mechanical linkage between the strain gauge and the measuring device, an extremely high degree of accuracy is possible. With proper calibration, changes as small as 20 millionths of an inch can be detected.

The chief difficulty from a materials standpoint in adapting the room temperature gauge to a high-temperature gauge was the mirror surfaces. A successful combination consisted of silver brazing a ¼ by 5/16 inch strip of 30-mil-thick platinum to the

(Continued on Page 44)
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Education is the springboard for your future. Couple it with the proper engineering experience, such as you receive at Garrett, and you have the ingredients for a successful career in engineering fields which will be expanding for years.

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In addition to direct assignments, a 9-month orientation program is available to aid you in selecting your field of interest. This permits you to survey project, laboratory and administrative aspects of engineering at Garrett. With company financial assistance you can continue your education at outstanding universities located nearby.

Project work is conducted by small groups where the effort of each individual is more quickly recognized and where opportunities for learning and advancement are greatly enhanced. For complete information, write to Mr. G. D. Bradley.

In the field of cryogenics, where temperatures approach absolute zero, design problems multiply. Garrett mechanical, chemical and metallurgical engineers worked together to produce this fan which rotates at 10,000 rpm at —420°F...without lubrication!

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AIRESEARCH INDUSTRIAL • REX • AERO ENGINEERING • AIR CRUISERS • AIRESEARCH AVIATION SERVICE

November, 1957
Seven League Boots  
(Continued from Page 17)

If all the mechanical sources in the United States were converted to man power, it would provide at least 100 hard-working slaves for each man, woman, and child in the country. This is no small number, yet it would only scratch the surface if the potential of atomic power could be exploited to capacity.

Atomic power is obtained from a nuclear reactor. A nuclear reactor is a device which controls the reactions occurring in an atomic explosion and could be able to provide a new source of power. The last decade has seen the development of the nuclear reactor to the point where it has successfully been used to produce electricity and to power a submarine.

The basis of the nuclear reactor is the phenomenon of atomic fission. Fission occurs when the atoms of certain elements split into two parts when struck by a neutron, releasing more neutrons and energy. The released neutrons then strike other atoms, causing them to split and release still more neutrons and energy, and a chain reaction is started.

Thus far, uranium and thorium are the only two natural elements which can be used to sustain a chain reaction. Since thorium is not used in its natural state, it can be enriched, or it can be converted into the artificial element plutonium.

There are three groups of reactors: research reactors, breeder reactors, and power reactors. At present, research reactors are the most numerous.

Research reactors are reactors given to universities to acquaint the faculty and students with the basic principles of atomic energy. After they are thoroughly versed with the principles of these reactors, the universities are allowed to conduct experiments with the reactors. Through these experiments many useful ideas have come out of the theory of atomic fission.

Because of the small supply of uranium in the world, the use of nuclear reactors in the future depends on the success of the breeder reactor. If reactors can be built which will efficiently produce more fuel than they consume, a very important advance will be made towards the solution of the problem of the Earth's dwindling fuel supply. In comparison with the total fossil fuel reserve, this is not a very pressing problem. The known coal reserves will last about 200 years at the present rate of consumption and the approximate reserve of nuclear fuels is about 22 times greater than all the fossil fuels combined.

The one use of the nuclear reactor which has the greatest appeal to the public is as a nuclear power plant. The Atomic Energy Commission is now allowing private industry to enter the nuclear field, and the next five years will witness the construction of nuclear power plants supplying large cities with electricity.

At present, the plants now under construction or in the planning stage are not meant to compete with or replace conventional power plants. They are, however, being built to determine the most economical and efficient methods of running a nuclear power plant, and it is hoped that these new plants will be steps in the development of a nuclear power plant which can produce electricity at a lower cost than a coal-operated plant.

Yet there are even greater sources of power than most of us realize. Vast quantities of energy are waiting to be tapped for use in controlled thermonuclear devices. The controlled production of the sun's source of energy has long been a dream on earth, but this dream may soon become reality. The implications of the controlled release of thermonuclear power on our future energy supply are tremendous. One estimate, based upon sea water as a fuel, predicts that one per cent of the ocean's deuterium could supply our present power requirements of 10^9 kilowatts for 10^17 years. Even more astounding is the possibility of direct conversion of this energy into electricity. Such a process would overcome the inefficiencies of the thermal cycle required for all the present techniques of power generation.

Thermonuclear, or fusion power, is released when two nuclei of light elements collide with sufficient energy to overcome the coulomb electrostatic repulsion and interact to form a compound nucleus. At the extremely high energies required for such an interaction, the temperatures are enormously high and atoms are entirely stripped of their electrons.

The principal difficulty in initiating the reaction is the very high temperatures (kinetic energy) required, being in the order of tens of millions of degrees Kelvin. Such enormously high temperatures present a tremendous problem of confinement. All matter as we know it vaporizes at temperatures several orders of magnitude less than those required for the fusion reaction. The only plausible means presented for the confinement of material at these elevated temperatures depends on the use of magnetic fields.

Since the thermonuclear research and development project is still in its infancy, it is difficult to forecast the date that fusion reactors will be proven successful, but the mere possibility of having unlimited energy available is laying the cornerstone for industrial expansion in the future. Not only does fusion tap a larger energy reserve than fission, but it has unique advantages in waste disposal. The only products of a fusion reaction of deuterium and tritium are helium and neutrons.

These advantages plus the speculated possibility of direct conversion to electrical energy make the fusion program of great interest to government and industry alike. The impact of controlled thermonuclear power may open a new era that is beyond our present comprehension.

With the addition of atomic energy and thermonuclear energy to the conventional fuels, we don't need to worry about using up all the available power to run our factories. All through the ages, when a need for power developed man has found the answer.
Pushing back the frontiers...in chemistry

Exploring new frontiers is still a pretty exciting business, especially in the great scientific and research centers like the Whiting Laboratories of Standard Oil Company. Here men like Dr. Omar Juveland are engaged in important exploratory work such as the search for new and improved catalysts for use in high polymer chemistry. In the photograph, Dr. Juveland is recording data on a polymerization process taking place in this research area.

Dr. Juveland is one of the group of young scientists in Standard’s Hydrocarbon and Chemicals Research Division. Born in Lake Mills, Iowa, he did his graduate work in organic chemistry at the University of Chicago. He received his BS in chemistry from St. Olaf College, Northfield, Minnesota, in 1950. He is a member of Phi Beta Kappa, Sigma Xi, and the American Chemical Society.

Busy young men like Dr. Juveland have found opportunity and work to their liking in the Standard Oil Laboratories at Whiting, Indiana. They share in the progress and accomplishment which contribute so much to the technical advancement and improvement required by America’s expanding economy.
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THE ROSE TECHNIC
Problems?
(Continued from Page 19)

As mentioned before the system will be self-supporting because of the sale of heat energy to local citizens. Also, it is planned to obtain a patent on the system and then sell the patent rights to Purdue since they probably have similar problems.

Visking Corporation is donating the plastic bags and the plastic pipe so as to make a large scale test on the deteriorating effects of sewage on polyethylene. A small amount of hydrogen will be put in pockets lining the bags to insure floating ability.

Freshmen will be used in supervisory capacities at the airlock in the mornings and evenings. Also, freshmen will be used as flow traffic directors in the evenings. They will be stationed at sewer intersections in Terre Haute. This will eliminate sewer riders missing the turnoff to the sewer nearest their home.

This system has one disadvantage, equipment or supplies must be brought in piece by piece. Otherwise, it is flawless.

This system will be able to be put into effect the day the 1957 fall term begins. It can't be started until then because of the need of freshmen for operators.

It is requested no one tell anybody else outside of Rose Poly that this system is being adopted. Otherwise it is feared that no one will enroll in the 1957 freshman class.

"INSTALLING THE BENCH"
by Fall Pledge Class 1957

As everyone knows, there has been some discussion relative to the installation of a slab of limestone known as the Senior Bench. When first put in by the Seniors, they remarked that it was in to stay. However one morning two days later, they were chagrined to find the shattered abutments as a monument to their underestimation of the forces acting against them. Therefore the Tau Beta Pi pledge class was called upon to expend their energies in

(Continued on Page 42)

Locker Rumors
(Continued from Page 14)

The things which favor the engineers are their size and depth. Though the team is inexperienced the roundballers are expected to make up for this in fire and scrap. Judging from the broken teeth, sore elbows, and bruises these are two qualities which this year's club will not be lacking.

The season opens November 23 with Vincennes at Vincennes. Marian College of Indianapolis will be the first to face the Rose men on the Rose court, November 26. BACK THE TEAM!

INTRAMURAL ATHLETICS

FOOTBALL
Football on the intramural fields has drawn to a close. The winner of the All-College League was the Seniors. They finished the season with an astounding 10-0 record. The Seniors, in a post-season tilt, will face an All-Star team picked by the team directors. In the fraternity league action, Theta Xi won the Intrafraternity Trophy with a 5-0 record. ATO, Lambda Chi, and Sigma Nu followed in that order.

BASKETBALL
Once again the old roundball starts to bounce into the Intramural picture. The fieldhouse is open for practice sessions for the teams, and league play will begin the following week. Many students have signed up for the teams and there should be some exciting contests in this season's play.

VOLLEYBALL
With all the intramural program moving indoors, the volleyball courts will be set up indoors as soon as Varsity football is ended. Last year volleyball had some of the best participation of any of the intramural sports and this year should be no exception.

Just one final word of advice to all classes, departments, and dorm units; Hurry and get your men organized to participate in the Intramural program. Now is the time to build up a big supply of intramural points toward the All-Intramural Trophy!

November, 1957

An FTL "First"-

TACAN
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East Coast Laboratory and Microwave Tower
PARKERS

(Continued from Page 15)
in the day. The second fellow — I only know of one such case on the Rose campus — is the fellow who has been so unfortunate as to have lost the use of his reverse gear. Therefore, each morning he finds it necessary to come tearing down the hill, execute an about face with his vehicle, and roll back into his parking place, thus saving the need of the reverse gear in getting out.

We finally come to the third and last type of Parker. The bar-bender type is perhaps the most nerve-racking of all parkers. This group consists of a wide array of idiots who mercilessly persist in reshaping the dividing bar each morning by either consciously or unconsciously assaulting the defenseless piece of metal with their bumpers. Each morning the still morning air resounds with the clash of metal upon metal, steel upon steel, and highly prolific though undignified commentary. This group of parkers also falls into several sub-groups, the first of these being the driver who simply has no brakes and finds it quite convenient to bring his car to a pronounced standstill by the basic natural law that moving objects seem to stop upon coming in contact with a rather immovable barrier. This particular group is quite easily recognized by the downward sweep of the grille.

The second member of this group is the depraved would-be race car driver who comes thundering down the hill and around the curve and slyly skids fifty feet across the lot to come to an abrupt stop at the bar with a most prodigious clang. This type can easily be differentiated from the screeching of his brakes.

Also among the hit-and-shudderers is the self-appointed expert on driving who likes to impress his friends by being able to halt his car a mere fraction of an inch from the bar. He very rarely succeeds, but the few instances when he does more than make up for the failures, or so he says.

There is also the fellow who is mad at the world and takes his spite out on the bar. However, we shall skip this particular phase.

And last but certainly not least on our all-car list is the fellow who has been out on a late date the night before and is extremely fortunate to have made it to school at all, let alone keep from hitting the bar. This fellow we excuse from our narrative since it’s obvious he has enough troubles as it is.

There is indeed a wide array of different parkers in the east lot. From overly-cautious to overly-lazy, from the brakeless to the wakeless. Whatever their category, whatever their excuse, whomever they may be, from this towering throng comes but one platitudinous cry, ‘Friends, Rosemen, Engineers, lend me your car. Mine’s in the body shop for repairs.’

Written as an English theme and submitted on suggestion. — Frank H. Jett, Freshman, Section C.
"For today's engineer, yes..."

"You are probably the most sought after young men in America today. Industries of all kinds want you. You've got a wide choice, so which field do you choose? "The way I look at it, the aircraft industry has the most opportunity for you. It combines more advanced engineering sciences than any other field...electronics, communications, propulsion systems, hydraulics and pneumatics, thermodynamics...all these and many others. With this variety, interesting careers can be had either by specializing in one area or by moving from one to another.

"Obviously, you are going to want recognition for your work. You know that the aircraft industry pays well...but think about this: aviation is relatively young and its life-blood is young men with new ideas. Numerous important advances have been made just in the last few years. Who knows what new fields—and new opportunities—today's research will uncover? "So, for today's engineer, yes, I would say that your best bet is the aircraft industry. Nowhere else can you find such opportunity, such challenge...and such compensation and added benefits. In my estimation, there is no place where you can put your college training to better use!"

In the aircraft industry there is such a variety of engineering fields that a desire for virtually any one can be satisfied. As research continues more areas will be embraced and, as aircraft engineers pierce these barriers and solve today's problems, new challenges and opportunities arise. Northrop engineers have been meeting these challenges successfully for years. Airplanes such as the F-89 Scorpion, the new supersonic twin-jet Northrop T-38 trainer, and missiles such as the Snark SM-62 are examples of Northrop's engineering theory and capabilities.

In Northrop's new Engineering and Science Center, your training can be applied to top priority projects and your future will be made more secure by intensive on-the-job training. Regular reviews reward you for your capabilities and accomplishments, adding further financial security. The extra benefits at Northrop, such as company-paid insurance and over three weeks vacation with pay, are among the most generous in the entire industry.

Write now and ask us how your qualifications can be applied to a career at Northrop. Regardless of whether you are an upper-classman or not, we believe we can show you that Northrop offers you a great future. Address Manager of Engineering Industrial Relations, Northrop Division, Northrop Aircraft, Inc., 1032 East Broadway, Hawthorne, California.

NORTHROP
Northrop Division of Northrop Aircraft, Inc.
BUILDERS OF THE FIRST INTERCONTINENTAL GUIDED MISSILE

November, 1957 Page 41
Problems

(Continued from Page 39)

finding a more permanent way of fixing the bench.

An astute civil in the pledge class had a brainstorm for the development of a gravitational machine. The principle of this machine is that it will attract anything within its field with a force equal to any force acting upward on the object. However, this has limitations, for anything coming within its field would not be able to get out of the field. Hence, selective measures had to be taken.

A search for materials led nowhere until a friendly UFO (unidentified flying object observer), spotted a strange happening on the Rose campus. Investigation proved that a meteor had fallen from outer space. Samples of it were rushed to the chemistry lab for analysis. The report showed that the meteor contained an entirely new element unknown to science. It was decided to call this element Sputnikium. When tested in the Physics lab, it evinced peculiar gravitational properties.

Now a crash program was instituted by the pledges for the development of the proper machinery. After the expenditure of much sweat, erasers, and midnight oil, the answer was found.

The heart of the installation lies in the gravitational machine. For brevity it was christened FLUNK, standing for fulminating levitational non-integrating contraption. The principle of operation lies in the fact that a critical amount of Sputnikium will attract another critical amount unidirectionally. An analogy to this phenomenon is the action of a Chinese finger trap found in most carnival novelty stands. An excess of the critical amount was ground up very finely and suspended in water from Lost Creek. The mixture was then painted on the bench in such a way that the Sputnikium particles penetrated the pores of the bench and became permanently imbedded in them.

The next step was the design of the mounting of the bench to take advantage of the gravitational properties of the element. The final choice was a bowl or saucer shaped depression constructed of concrete. This type of construction especially prevents the removal of the bench. If someone tries to slide the bench off its platform (see diagram), he must then exert a force having an upward component to remove the bench from the bowl. The upward force is counteracted by FLUNK. Any increase in upward force instantly results in a corresponding increase in the downward force.

Computation of Minimum Force for Removal.

To remove the bench, the whole concrete bowl, the bench, and the FLUNK unit must be removed. Computation of the minimum force Q, follows. See diagram for force Q.

\[ Q > weight \text{ of bench} + weight \text{ of concrete bowl} + weight \text{ of Flunk} \]

Weight of bench = 1000\#  
Weight of Flunk = 393.7601\#  
Weight of Bowl = 100\# / cu. ft.

The pledge class feels this is sufficiently large to prevent easy removal of the bench.
**Fraternity Notes**  
(Continued from Page 16)

going on this year. One of the first items to be noted is the face-lifting of the house due to be completed in approximately two months. The outside trim and windows are to be painted, and, although I've never seen a drip anywhere in the house, there will be some repairs made outside on the gutters, and inside on the plumbing. We will sport newly papered walls throughout the house, and will have a brand new room full of furniture. The new furniture will be in our T.V. Room. Things will probably be in quite a turmoil during the improvement period, but I and all my brothers are looking forward to seeing the finished product.

With Homecoming over and decisions rendered (who had best displays, the best parties, etc.), the men of Sigma Nu are all busy preparing a float to be entered in the Thanksgiving Day parade here in Terre Haute. In command of this venture is none other than your friend and mine, Dick L. Peter. And incidentally, I'm led to believe that someone named D.L. finally got a report in on time this year—"well done D.L., well done."

On Friday evening, October 18, the chapter had the pleasure of acting as host to twenty-five beautiful Saint Mary's girls. Dancing to soft music, food, and laughter seemed to whiz most of the time away, laughter being the result of a skit and Jack Gaughan's humorous palaver, "Harvest Moon" was the theme, and old clothes only were allowed.

A dinner in honor of the wives of Sigma Nu, was held on Monday, October 13, and the Chapter expresses its regrets that Mrs. LaPosa was unable to attend. The food was wonderful, and the conversation superb.

Congrats to Brother Ned Kurts and his pinning of Miss Judy Gehhart. You kept your secret well Ned, tis' a secret no more.

And now, a special set of congratulations are extended to all the men during last week's Open House. I believe I may say, for the men in all the houses, that the evening was enjoyed, and that we were all glad to meet each and every one of you.

Fred Ryker

**THETA XI**

**THE TIGERS DID IT AGAIN!**

The TX Tigers have completed their second undefeated Inter-fraternity football season, retaining he trophy. This brings the total to thirteen straight wins. Now all the Brothers are preparing for the basketball season.

Homecoming has once again come and gone. The party at the TX House was a grand success. Many alumni were present to talk over old times and new endeavors. Several of the "Joy Boys" of years past conducted an impromptu dancing lesson in the basement, followed by a "Hawg-calling Contest." Much information was gained by the brothers in these necessary arts.

The "get-acquainted" parties for the freshmen were also a great success. Many fine and interested freshmen were in attendance. We sincerely hope they all had fun.

Congratulations are in order for several of the Brothers who recently became pinned. These happy (?) chaps are: Brothers Blastic, Bock and Mathews.

The annual Christmas party is planned for December 14th. All the Brothers are expectant of a good time. Favors will be given to each Brother. These favors are intended for the Brother's date. Sorry I can't give you an idea of what it will be, but it will be fuzzy and mechanical. Curious?

The new roof is finally on the House at 902 S. Sixth St. Work in the basement is almost complete. One wall has been covered with wood paneling half-way up, and columns to the ceiling. It really is an improvement over that flaking plaster. All the Brothers who had a part in this undertaking take a bow.

Well, I guess that's all the news for now. See you in the next Technic?

Eugene Amick

---

**American Air Filter Company, Inc.**

Louisville, Kentucky

Looking for a solid, satisfying career with a vigorous company in a growing industry? American Air Filter Company, Louisville, Kentucky—world's largest manufacturer of air filters, dust control and heating and ventilating equipment—needs graduate engineers to fill responsible jobs in sales, engineering and production in its 125 field offices and nine manufacturing plants located in six cities.

In July of 1958, AAF will inaugurate its next five-month technical training course for a select group of engineering graduates. This full-time program combines classroom work, under the direction of competent instructors, with field trips to both company plants and large industrial users of AAF products.

An American Air Filter representative will be on your campus at an early date to interview interested seniors. For the exact date and time, contact your Placement Office, now.
RESEARCH & DEVELOPMENT
(Continued from Page 34)

Refractaloy knife edge blocks. Even at 1250 degrees Fahrenheit, the platinum stays bright and reflective and the 20 millionth of an inch accuracy is now almost as easy as it was at room temperature.

SQUARE BUBBLES
Square bubbles, the first such phenomena ever observed in nature have been found by a General Electric Company scientist.

Peter Senio, a metallurgist at the laboratory, disclosed that brilliantly colored microscopic bubbles in square and rectangular forms appear in lithium fluoride crystals after they have been irradiated with neutrons in a reactor, then heated above 600 degrees Centigrade (1,112 degrees Fahrenheit).

Lithium fluoride is a clear, glass-like material irradiated to study the effects of neutron bombardment and to associate the results with materials that make up a nuclear reactor. During the studies, it was found that lithium bubbles appear first in bright colors. The colors show that these bubbles have a third dimension, even though they are extremely thin, measuring only about three one-hundred-thousandths of an inch. As the bubbles thicken, they turn white.

It is believed that the formation of helium and tritium gasses in the irradiated lithium is responsible for the bubbles. So far, however, it is questionable why square and rectangular bubbles appear rather than conventional spherical ones.

MERCURY LAMPS
One of the highest efficiency mercury lamps ever designed for general lighting has been announced by the General Electric Lamp Division. The 1500-watt mercury quartz lamp operates at an efficiency of 54 lumens per watt. The "Mercury 1500" has the highest light output of any mercury lamp of this length ever produced for general lighting. It is expected to meet with wide acceptance in lighting large outdoor areas especially where better than average illumination levels are desired.

The new lamp is tubular in shape and operates without the glass jacket usually associated with lamps of this type. The luminaire housing series as a protective jacket which also absorbs the ultra-violet radiation produced by the lamp.

The overall length of the lamp is 19-9/16 inches, giving it a nominal lighted length of 12 inches. It has a single contact terminal at each end fitted into a specially-designed ceramic base which is slotted along its length to provide convection cooling for operation at high temperatures.

The lamp operates at 1500 watts, is rated at 81,000 lumens, and will perform effectively at temperatures as low as —20 degrees F, when equipped with the proper ballasts.

EXTREMELY SMALL PERMANENT MAGNETS
Permanent magnets as small in diameter as a human hair have been made from Cunife at the National Bureau of Standards. Cunife is an

Detroit Edison Co.
ELECTRICAL POWER
CAREER OPPORTUNITIES
Research and Development
Plant and System Design
Equipment Engineering
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Electrical - Mechanical ENGINEERS
RESERVE YOUR APPOINTMENT TIME AT
PLACEMENT OFFICE TO SEE OUR
REPRESENTATIVE
TUESDAY, FEBRUARY 28
Will Also Interview Sophomores and Juniors
Interested in Summer Employment

Industrial Latex Concrete
REPAIR—Topping-Welding
Eliminates all the tedious work necessary with ordinary cement repair materials.
Apply it as thin as 1/16"—or more than 1", whatever thickness needed.
Use indoors and out, to repair concrete, brick, stone, slate, stucco — all types of masonry surfaces.
Concrete color. Will not chip, crumble or powder.
No waste. Mix only what you need.
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Page 44
alloy of approximately 60 percent copper, 20 percent nickel, and 20 percent iron with an unusual combination of magnetic and mechanical properties. For example, Cunife — instead of requiring casting or sintering into a desired shape like most highly coercive magnet materials — can be cold drawn. This ductility suggests its use for very small magnets. In an effort to determine its suitability for this application, the Bureau's magnetic measurement laboratory carried out an investigation of Cunife's magnetic properties when cold drawn into fine wires.

Several investigators have reported on the magnetic properties of Cunife wire and on the effects of cold working and subsequent heat treatment. Their results have shown that even if the material is cold worked to the point at which the magnetic properties are adversely affected, the initial magnetic properties may be recovered or improved by simple heat treatment or baking. These reports, however, pertained only to the larger wire sizes. No data was available on the magnetic properties of Cunife drawn to wire a few thousandths of an inch in diameter.

From the Bureau's determinations it is possible to produce permanent magnets of Cunife as small as 0.005 in. in diameter by cold drawing larger sizes of the material through dies. If the cold-drawn wire is subjected to simple heat treatment, the permanent magnet properties of the material are substantially improved and are satisfactory for many magnetometer and galvanometer uses.

**NEW BRIDGE UTILIZES ECONOMIES OF HIGH STRENGTH STEEL AND SUBMERGED ARC WELDING**

A bridge, presently being built across the Carquinez Strait in California, marks a milestone in the advancement of welded bridge designs. Nearly 30 million pounds of steel, all shop welded, will be used in the superstructure of the four lane highway bridge. This includes nearly 6 million pounds of USS “T-1” constructional alloy steel in the most highly stressed members and 11 million pounds of USS “Tri-Ten” high strength, low alloy steel in other crucial members. Much of the welding is done with semi-automatic submerged arc welders using standard procedures and 70,000 psi tensile electrode.

Extensive use of the high strength steel affected cost savings estimated by the State of California Highway Department at $800,000. This results from the substantial weight reduction made possible by the high strength of the steel. The 45,000 psi stress allowed for the “T-1” is 2-1/2 times that permitted for ASTM A-7 steels and nearly twice that for ASTM A-242 steels. Approximately 15% of the steel in the bridge is “T-1”.

The welded design simplified members to three basic sections: H-sections for tension members, box-sections for members with normal compression, and internally supported box-sections for members with heavy compression.

---

**Woodridge Motel**

Member A.A.A.

and

Quality Motor Courts

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November, 1957
Electrical Transducers

(Continued from Page 20)

bank. They are supplied with 138KV from the generating plant and maintained a secondary voltage in 34.5 KV. The 138KV lines are the ones on the steel towers and may be seen when driving around Indianapolis. The tower lines make a complete loop from the generating plant passing through each substation. Therefore, any substation may receive power from either direction. If a break were to occur anywhere in the high voltage loop, all substations would still function. By using different rf signals that have been superimposed on these high voltage lines, the location of a break may be detected at the main generating plant. Repairs can then be made. The secondary voltage of these substations then feeds the smaller 34.5KV substations.

In a similar manner the 34.5KV substations are supplied from either direction by the loop method. Provision is made for disconnecting the 34.5 KV lines at the larger substations by main line circuit breakers. These breakers are oil filled to prevent arcing, and operate in a manner similar to the protector used in the underground vaults. The input power lines to the 34.5KV substations are mounted on telephone poles, rather than steel towers, and employ special high voltage insulations. Upon reaching the substation the power lines are terminated at an insulated steel framework, and from there descend to the transformer primaries.

The transformers are physically quite different from the transformers used in the underground vaults. They are either single phase or three phase transformers. In using the single phase transformers, three must be used, one for each phase of the incoming lines. This replacement is desired as three phase transformers occupy approximately one third the space used by three single phase transformers. All transformers are of the oil immersion type and forced air cooling is sometimes used. In using this method of cooling, the KVA ratings are increased approximately 5%. Normal ratings generally range from 100-KVR to 3000KVR. The secondary voltage is 13.2KV.

This secondary voltage is distributed to the residential consumer. It also is carried from the substation on similar telephone poles. The 13.2KV voltage now becomes the primary voltage for the transformer which directly serve the residential consumer. As you know each of these small transformers has a secondary voltage of 110/220V.

From this article you can see that the distribution of power from the generating plant to the home is an intricate system. Much more could be said concerning the ideas in this article and nothing has been said concerning the problems found in the generating plant itself. When you stop and consider that a kilowatt hour costs only 2 1/2 cents, don’t you think that’s a bargain?
IBM engineers needed a small steel tube—a memory unit for a computer—whose whirling surface would pick up thousands of complicated figures as magnetic impulses, retain and, years later, read them back instantly. This called for the cleanest, most uniform quality steel that could be produced. IBM consulted Timken Company metallurgists, who recommended a certain analysis of Timken® fine alloy seamless steel tubing. IBM found the steel so clean that when properly plated it accurately recorded up to 100,000 electro-magnetic impulses. So strong it withstood the centrifugal forces of 12,000 rpm without distortion or damage. It's another example of how Timken Company metallurgists solved tough steel problems.

WANT TO LEARN MORE ABOUT STEEL OR JOB OPPORTUNITIES?
To learn more about electric furnace fine alloy steel, send for "The Story of Timken Steel Quality". And for help in planning your future, write for "Career Opportunities at the Timken Company". We will reply promptly. The Timken Roller Bearing Company, Canton 6, Ohio.

See the next Timken Televent hour, "The Innocent Years" over NBC-TV, Thursday night, November 21st.

TIMKEN Fine Alloy STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

November, 1957
Engineer's Expense Account
for April

4-1 Advertising for female 
stenographer $1.50
4-2 Violets for new 
stenographer 1.50
4-8 Week's salary for 
stenographer 45.00
4-9 Roses for stenographer 5.00
4-11 Candy for wife .90
4-13 Lunch with 
stenographer 7.00
4-15 Week's salary for 
stenographer 60.00
4-16 Picture show tickets— 
self and wife 1.20
4-18 Theatre tickets— 
self and stenographer 15.00
4-19 Coca-Cola for wife .20
4-22 Virginia's salary 75.00
4-23 Champagne and dinner 
for Ginny 32.50
4-25 Doctor 375.00
4-26 Fur coat for wife 1275.00
4-27 Advertisement for 
males stenographer 1.50

Total $1896.30

St. Peter was taking a new ar-
rival on a tour of heaven.

"What," asked the stranger, "is 
that building with all the bars on 
the windows?"

"That's the jail," replied St. Pe-
ter. "We keep all the Texans there.
The fools all want to go home."

The main trouble with the 
straight and narrow is that there 
is no place to park.

You can lead an engineer to 
water, but why disappoint him?

Sign on door of the Marriage 
License Bureau: "Out to lunch. 
Think it over." 

Don't worry if your grades are low, 
And your rewards are few; 
Remember that the mighty oak 
Was once a nut like you.

An enormous player was at the 
plate and an equally large catcher 
stood behind him. The count was 
one and one. The little runt of an 
umpire watching the ball sizzle 
across the corner, yelled, "Two!"

"Two what?" snarled the catch-
er, mashing his mask into the um-
pire's stomach.

"Yeah, two what?" growled the 
batter, raising his bat.

The umpire looked from one 
brute to the other, and said: "Too 
close to tell!"

Daffynitions:
Honeymoon—The vacation a fel-
low takes before going to work for 
a new boss.

Ambitious wife—The power be-
hind the drone.

Two girls were being followed 
by a lone male on a beautiful spring 
day. Finally one of them, in appar-
ent indignation, turned to the 
young man and exclaimed, "Either 
you quit following us or-or--or go 
get a friend!"

Traffic Cop—Hey, you, didn't 
you hear me whistle?

Sweet young thing—Yes, dar-
ling, but you're wasting your time. 
I'm already engaged.

Prof.: "Why don't you answer 
when I call your name?"

ME: "I nodded my head."

Prof.: "You don't expect me to 
hear the rattle all the way up here 
do you?"

During a layover on a recent 
weekend trip, we overheard the 
ticket agent make assurances that 
a certain train would be on time. 
One man, after pacing the station 
platform for more than an hour, 
stalked angrily to the ticket win-
do.

"Why didn't you tell me this 
train was late when I asked you 
before?" he fumed.

"Look here, mister," replied the 
complacent agent, "I ain't paid to 
sit here and knock the railroad."

If it takes 10 hours for a wood-
pecker with a rubber bill to chop 
$65 worth of shingles from an oak 
tree, how long does it take a 
grasshopper with a wooden leg to 
kick the juice out of a dill pickle?

There is one nice thing about 
babies. They don't go around 
bragging about the bright things 
their fathers and mothers have 
said.

A small boy was seated on the 
curb with a pint of whiskey in his 
hand, reading Esquire and smoking 
a big cigar. An old lady passed and 
asked, "Little boy, why aren't you 
in school?"

The infant replied, "Dogonit, 
lady, I ain't but four."
PHOTOGRAPHY AT WORK
No. 30 in a Kodak Series

Pepsi-Cola International Panorama, a magazine of places and people, reaches people around the world, builds recognition for Pepsi-Cola as a product associated with the better, happier side of life.

Photography speaks in every language

This picture leaves no doubt that Netherlanders are neighborly.

To tell its story in 75 countries, Pepsi-Cola puts pictures to work to add meaning to the product's global billing as "the refreshment of friendship."

To build up an atmosphere of friendliness and understanding in markets around the world, Pepsi-Cola International publishes "Panorama"—and gives the brunt of the job to photography.

Photography knows no language barrier. It is clear to young and old alike—appeals to everyone. With photography, people are real; situations authentic, convincing. This is what makes photography such a powerful salesman.

Large businesses and small can use this powerful salesmanship—can also use photography to cut costs and save time in many other ways. It can help with problems of product design—can watch quality in production. It trains. It cuts office routine. You'll find that it can work for you, too.

EASTMAN KODAK COMPANY, Rochester 4, N.Y.

CAREERS WITH KODAK

With photography and photographic processes becoming increasingly important in the business and industry of tomorrow, there are new and challenging opportunities at Kodak in research, engineering, electronics, design and production.

If you are looking for such an interesting opportunity, write for information about careers with Kodak. Address: Business and Technical Personnel Dept., Eastman Kodak Company, Rochester 4, N.Y.
Although many surveys show that salary is not the prime factor contributing to job satisfaction, it is of great importance to students weighing career opportunities. Here, Mr. Gouldthorpe answers some questions frequently asked by college engineering students.

Q. Mr. Gouldthorpe, how do you determine the starting salaries you offer graduating engineers?

A. Well, we try to evaluate the man's potential worth to General Electric. This depends on his qualifications and our need for those qualifications.

Q. How do you evaluate this potential?

A. We do it on the basis of demonstrated scholarship and extra-curricular performance, work experience, and personal qualities as appraised by interviewers, faculty, and other references.

Of course, we're not the only company looking for highly qualified men. We're alert to competition and pay competitive salaries to get the promising engineers we need.

Q. When could I expect my first raise at General Electric?

A. Our primary training programs for engineers, the Engineering Program, Manufacturing Program, and Technical Marketing Program, generally grant raises after you've been with the Company about a year.

Q. Is it an automatic raise?

A. It's automatic only in the sense that your salary is reviewed at that time. Its amount, however, is not the same for everyone. This depends first and foremost on how well you have performed your assignments, but pay changes do reflect trends in over-all salary structure brought on by changes in the cost of living or other factors.

Q. How much is your benefit program worth, as an addition to salary?

A. A great deal. Company benefits can be a surprisingly large part of employee compensation. We figure our total benefit program can be worth as much as 1/6 of your salary, depending on the extent to which you participate in the many programs available at G.E.

Q. Participation in the programs, then, is voluntary?

A. Oh, yes. The medical and life insurance plan, pension plan, and savings and stock bonus plan are all operated on a mutual contribution basis, and you're not obligated to join any of them. But they are such good values that most of our people do participate. They're an excellent way to save and provide personal and family protection.

Q. After you've been with a company like G.E. for a few years, who decides when a raise is given and how much it will be? How high up does this decision have to go?

A. We review professional salaries at least once a year. Under our philosophy of delegating such responsibilities, the decision regarding your raise will be made by one man—the man you report to; subject to the approval of only one other man—his manager.

Q. At present, what salaries do engineers with ten years' experience make?

A. According to a 1956 Survey of the Engineers Joint Council*, engineers with 10 years in the electrical machinery manufacturing industry were earning a median salary of $8100, with salaries ranging up to and beyond $15,000. At General Electric more than two thirds of our 10-year, technical college graduates are earning above this industry median. This is because we provide opportunity for the competent man to develop rapidly toward the bigger job that fits his interests and makes full use of his capabilities. As a natural consequence, more men have reached the higher salaried positions faster, and they are there because of the high value of their contribution.

I hope this answers the question you asked, but I want to emphasize again that the salary you will be earning depends on the value of your contribution. The effect of such considerations as years of service, industry median salaries, etc., will be insignificant by comparison. It is most important for you to pick a job that will let you make the most of your capabilities.

Q. Do you have one salary plan for professional people in engineering and a different one for those in managerial work?

A. No, we don't make such a distinction between these two important kinds of work. We have an integrated salary structure which covers both kinds of jobs, all the way up to the President's. It assures pay in accordance with actual individual contribution, whichever avenue a man may choose to follow.

* We have a limited number of copies of the Engineers Joint Council report entitled "Professional Income of Engineers—1956." If you would like a copy, write to Engineering Personnel, Bldg. 36, 5th Floor, General Electric Company, Schenectady 5, N. Y.