Design a 2-lane steel bridge to cross a modern highway—
$44,000 in cash awards!

American Bridge Division of United States Steel announces a $44,000 STEEL HIGHWAY BRIDGE DESIGN COMPETITION dedicated to stimulating the engineering mind to a more imaginative, more effective use of steel in the construction of small bridges.

If you, as a professional or design engineer or as a college engineering student, can come up with a more imaginative, attractive and economical design, not only may you win up to $15,000 in award money, but your efforts may contribute materially to the most challenging roadbuilding program ever undertaken. For, according to conservative estimates, the tremendous 41,000-mile Federal Highway Program will call for the construction of at least a bridge a mile!

The competition involves solving a relatively simple but important problem that will not demand too much of your time.

Send for your entry booklet now: Contains complete information on the Steel Highway Bridge Design Competition—everything you need to know to prepare your entry. Just fill in and mail the coupon and get started with your design without delay.

Awards for College Engineering Students each
1st Award .............................................. $4,000.00
1st Honorable Mention ............................... $2,000.00
2nd Honorable Mention ............................... $1,000.00
Four 3rd Honorable Mentions ................ $ 500.00

Awards for Professional Engineers each
1st Award .............................................. $15,000.00
1st Honorable Mention ............................... $10,000.00
2nd Honorable Mention ............................... $ 5,000.00
Five 3rd Honorable Mentions ................ $ 1,000.00

Problem: Get two lanes of traffic across a modern 4-lane highway in accordance with latest standards for today's highways.

Objectives: Originality of design, greater utilization of the inherent properties of steel, economy, and aesthetic appeal.

Requirements: Just one. The steel bridge must comply with the Geometric Standards for the National System of Interstate and Defense Highways using H-20-81644 loading. The type of structure, the type of connections, span length and number of piers, if any, are completely up to you since you are designing with steel.

Eligibility: The competition is open to all professional and design engineers and college engineering students except employees and/or members, and their immediate families, of the following firms and groups:
United States Steel and its subsidiaries, divisions, agents and dealers
Structural steel fabricating firms
American Institute of Steel Construction Rules Committee and Judges
See list of awards above.

Rules and Judging: The competition will be under the supervision of the American Institute of Steel Construction, which has appointed a Rules Committee and a panel of judges composed of prominent consulting engineers and architects.

Deadline: Entries must be postmarked or expressed to arrive not later than midnight, May 31, 1959. USS is a registered trademark
Meet the man who watches Moscow from Michigan Avenue

Jacob G. Tolpin, expert in the field of foreign scientific developments, often is consulted by leaders in academic, government and industrial enterprises.

He keeps tab on Russian scientific moves

What are Russian scientists up to now?
Few people in America are better able to answer this question than a mild-mannered, unobtrusive man dressed like other business executives on Chicago's Michigan Avenue.

There is no cloak-and-dagger atmosphere surrounding Jacob G. Tolpin.

It has been the daily job of Mr. Tolpin since 1937 to keep track of Russian scientific advances. He is a key man on the staff of specialists at Standard Oil who analyze foreign technical journals and patents.

The primary purpose of this work is to keep Standard Oil research scientists informed of developments throughout the world. But the work has broader significance. Standard Oil furnishes important foreign technical data to nationally important bodies and to libraries, such as the Library of Congress. The knowledge gained from the foreign periodicals thus is made available to all.

Even the Russians admit, says Mr. Tolpin, that American knowledge of petroleum technology is superior to their own. Standard's research at Whiting and other centers has resulted in many important discoveries which have helped to make America supreme in the field of petroleum and to strengthen its defenses. In the last few years alone, Standard scientists have made outstanding contributions that have advanced America's missile program and its jet air defense.

Since our first laboratory opened 68 years ago, we have spent hundreds of millions of dollars to learn more about oil—how to find it, produce it, refine it and make it more useful to more people than ever before.

What makes a company a good citizen?
One measure is the contribution a company makes to the economic and physical strength of its country. Through constant and intensive research, we at Standard have tried to make oil yield its maximum usefulness—both for civilian and military purposes. Steadily mounting efficiency also has helped to keep the price of oil and gasoline down.

STANDARD OIL COMPANY

October, 1958
Westinghouse is the best place for talented engineers

Howard Zollinger joined Westinghouse in 1951—has since earned MSEE and two U.S. patents

At 28, Howard A. Zollinger, a 1951 BSEE graduate of Michigan College of Mining and Technology is doing "...exactly what I always wanted to do." Now a systems design engineer, he specializes in the development of modern materials handling systems to support increasingly automated production techniques. Since completion of the Westinghouse Student Training Course in 1952, he has earned an enviable reputation as an expert in drive systems; and he has submitted fifteen patent disclosures, two of which are about to result in patents in his name.

Most important, Howard Zollinger is doing exactly what he wants to be doing. At the completion of his training course, he specifically asked that he be assigned to his present department. And, when he decided that additional graduate study would be helpful, the Westinghouse Graduate Study Program enabled him to combine this study with his regular job. After completing all required course work and his thesis last December, he was awarded his MSEE by the University of Pittsburgh in June.

Howard Zollinger is one of many talented young engineers who are finding rewarding careers with Westinghouse. You can, too, if you've got ambition and you're a man of exceptional ability. Our broad product line and decentralized operations provide a diversity of challenging opportunities for talented engineers. Guided missile controls, atomic power, automation, radar, semiconductors, and large power equipment are only a few of the fascinating career fields to be found at Westinghouse.

Why not find out now about the opportunities for you at Westinghouse? Write to Mr. L. H. Noggle, Westinghouse Educational Center, Ardmore & Brinton Roads, Pittsburgh 21, Pa.

YOU CAN BE SURE...IF IT'S

Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS"

CBS TV MONDAYS

THE ROSE TECHNIC
Contents

Editorial .................................................. 9
The New Frontier ........................................ 10
Diamond Jubilee Homecoming ............................ 12
Fuel Injection ............................................. 14
Isotopes In Action ...................................... 16

* * * * *

Fraternity Notes .......................................... 15
Campus Survey ............................................ 17
Meet The Faculty ......................................... 18
Locker Rumors ............................................ 19
Alumni News .............................................. 20
Research and Development .............................. 24
Library Notes ............................................ 28

* * * * *

Advertising Index ....................................... 43

Cover

"Here the brush of Stanley Meltzoff graphically depicts the alpha and omega of another great power project—the intricate installation nearing completion, the gloved hand of a skilled craftsman grasping the template used by the engineer and draftsman in translating the design. Reproduced through the courtesy of United Engineers & Constructors Inc. of Philadelphia, Chicago, and New York."

Printed by Moore-Langen Printing and Publishing Co.
140 North Sixth Street, Terre Haute, Ind.

Published monthly except June, July, August, and September by the Students of Rose Polytechnic Institute. Subscription $2.00 per year. Address all communications to the ROSE TECHNIC, Rose Polytechnic Institute, Terre Haute, Indiana.

Entered in the Post-office at Terre Haute as second-class matter, as a monthly during the school year, under the act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized December 13, 1918. This magazine does not necessarily agree with the opinions expressed by its contributors.
If you're the kind of engineer who wants to do big things in a big way, perhaps General Motors has a place for you.

For at GM, "The Inquiring Mind" is free to roam— free to explore the scientific world in an effort to find new and better roads to progress.

And the men who search for—and find—these new paths, also find opportunity without limit.

For GM is quick to recognize ability—quick to reward it with ever-increasing responsibility—quick to promote talented men to supervisory and executive positions throughout its organization.

Where will you use your abilities and talents? The fields cover the entire spectrum of engineering and science.

Automobiles, trucks, locomotives, aircraft, yes. But power transistors and solar energy, too. Astronautics, astrodynamics and electronics, as well. Rocket propulsion, missile guidance, the entire field of space engineering and science are all concerns of various General Motors Divisions.

And you will not necessarily be confined to just one of these fields. Depending on where your talents lie, you'll find yourself concerned with many fields at various times.

Breaking barriers of technology is a specialty with the engineers and scientists who work at General Motors' 35 Divisions and 126 plants in 71 cities and 19 states—and at our Technical Center near Detroit. If that's the kind of work that fascinates you, let us hear from you.

GM Positions now available in these fields for men holding Bachelor's, Master's and Doctor's degrees:

Mechanical Engineering • Electrical Engineering • Industrial Engineering
Metallurgical Engineering • Aeronautical Engineering • Ceramic Engineering
Mathematics • Industrial Design • Physics • Chemistry
The biggest construction job in history is under way. It's the building of a vast new network of Interstate Highways. Miles and miles of highway. For trucking. For travel. For defense. Some 41,000 miles in all. In addition, many thousands of miles of primary and secondary roads are being built in a greatly expanded "ABC" Highway Program.

With these new highways will come new industries ... new communities ... a greater share in national life for everyone.

*It's a big job... an important job!*

And you're on the right road when you study asphalt technology ... asphalt's characteristics and its applications in pavement construction.

Asphalt pavement is playing a leading role in the construction of the Interstate System. It now surfaces 81% of State Primary and Municipal Extensions — the nation's most heavily traveled roads—and 85% of all paved roads and streets in the country.

Your contribution — and reward — will depend in part on how much you know about it.

Do you know, for example, how Asphalt fits into the over-all petroleum family? This chart illustrates the inter-relationship of Asphalt with other refined petroleum products.

The semi-solid form — Asphalt cement — is the basic paving material. It is used in hot-mix Asphaltic pavements for roads, airfields, parking lots and thousands of construction and industrial applications.

Liquid Asphalt materials — road oils, emulsions and cutbacks — are used extensively for a variety of construction and specialty applications.

**Special Student Kit on Asphalt Technology Free!**

Literature included gives you a broad concept of Asphalt products—its sources, production, characteristics and uses. Put yourself on the right road by sending for your kit today. A postcard will do.

**THE ASPHALT INSTITUTE**

Asphalt Institute Building,
Campus—University of Maryland
College Park, Maryland

Ribbons of velvet smoothness...
ASPHALT paved Interstate Highways

October, 1958
Freezing water to warm a mine

Inco shows a king-size operation that helps mine more Nickel

The bigger the mine, the more men at work, the more air they need. Gales of air. Warmed in winter. Cooled in summer. That's the reason for this mammoth "air conditioner" in an Inco-Canada mine.

In winter it raises the temperature of cold air from outside by making ice. In summer it uses the ice to cool air that's too hot! (See diagram below)

In winter, cold air is blown through sprays of warmer water. The water loses its heat, freezes into mountains of solid ice. In the process, the latent heat of freezing is transferred to the air, warms it up for use inside the mine.

At full capacity in a winter season, this system alone can generate as much heat as 350,000 gallons of fuel oil. During this period, 150,000 tons of ice may form. (See photo at left)

Installations like this are expensive in time and money. Such outlays are typical of many made by Inco-Canada. Their cost adds up to millions. Results are—to continue the increased production of Nickel.

Mining for Nickel is a 45-minute color film loaned to high school science groups, college engineering classes and technical societies. Write to Educational Service, Development and Research Division,

The International Nickel Company, Inc.
New York 5, N. Y.

A mountain of ice, built up in this inside-a-mine "air conditioner." The rock chambers, or "stopes," where the ice forms, are high as a 23-story apartment, big enough to house 300 families. Things have to be done in a big way to get Nickel in the tremendous amounts used by industry to make metals that perform better, longer.
HIGH SCHOOL GRADUATES OF 1959

You are cordially invited to visit Rose Polytechnic Institute where you can earn a degree in:

- Chemical Engineering
- Electrical Engineering
- Mechanical Engineering
- Civil Engineering
- Mathematics
- Physics
- Chemistry

The next freshman class will be admitted
September 14, 1959
A Tribute...

On September 1, 1958, engineering education and Rose Polytechnic Institute suffered a sudden and severe loss. Dr. Ford L. Wilkinson, Jr. will forever be remembered by those privileged to have known him. His intellect, poise, and almost unbelievable insight brought to him the highest respect from both industry and university, from student and alumnus. Dignity coupled with humility enabled Dr. Wilkinson to achieve a status which few can attain, fewer can hold, that of a true gentleman.

Born in Elkton, Kentucky in 1895, Dr. Wilkinson attended Georgia Institute of Technology, the University of Georgia, and the United States Naval Academy. After receiving his B.S. degree in 1918, he served ten years as an officer in the United States Navy. During this time he completed his study at Columbia University and was awarded his M.S. degree in Mechanical Engineering.

After seven years of outstanding work in industry, Dr. Wilkinson accepted the position as head of the Department of Engineering at the University of Tennessee. From 1938 to 1947 he was dean of the Speed Scientific School at the University of Louisville. In 1947 he returned to the Navy Postgraduate School to serve as dean before accepting the presidency at Rose in 1949. He was awarded the degree of Doctor of Engineering at the University of Louisville in 1947.

In April 1956, Dr. Wilkinson was named “Engineer of the year in Indiana” for “outstanding work as a citizen, engineer, and educator of engineers”. He was a member of Tau Beta Pi, Sigma Tau, Phi Kappa Phi, Omicron Delta Kappa, American Society for Engineering Educators, Academy of Political Science, and American Society of Mechanical Engineers.

Perhaps few students of Rose can visualize the overwhelming job the president of a privately-endowed college must perform. The social aspects of such a position are certainly time consuming. These, added to the necessary administrative duties, constitute a large amount of work, but actually convincing industry of the value of engineering education and the need for economic support is a feat which requires the ultimate in tact, insight, and concentration.

In his work, Dr. Wilkinson did much for Rose and for engineering. He was never too busy for a student in need; never gave a decision without first an explanation.

Dr. Ford L. Wilkinson, Jr. will live on in all our minds, as do all truly great men. To him, we pay tribute—

D.G.M.
Throughout the nineteenth century the American frontier moved steadily westward. In 1890 the U.S. Census Bureau announced that the frontier had disappeared. Indeed, nearly all of the tillable land had been settled by that time; but there still remained much unsettled land, much “frontier.” This remaining frontier consisted of the many, many millions of acres of arid and semi-arid land which lay between the Mississippi River and the Pacific Ocean.

One of the largest and most interesting of the U.S. government’s water diversion projects is formally known as the Colorado-Big Thompson Project. This project, which had a total cost of $160,000,000, includes 128.8 miles of canals and tunnels. The most famous of the tunnels is the Alva B. Adams Tunnel, which pierces the Rocky Mountains a distance of 13.1 miles, crossing the Continental Divide 3800 feet below the surface.

The Colorado-Big Thompson Project, located in northeastern Colorado, collects, stores, regulates, and diverts surplus water of the Upper Colorado River for supplemental irrigation of 615,000 acres of highly developed land in the South Platte River Basin. As a valuable by-product, electric energy is generated by the falling water.

Green Mountain Reservoir on the Blue River stores and regulates water for the benefit of Western Slope water users. A system of reservoirs and aqueducts on the Western Slope stores and transports the surplus waters to the Alva B. Adams Tunnel for diversion under the Continental Divide. On the Eastern Slope the diverted water passes through four powerplants and the Foothills storage system on its way to beneficial uses in the fertile plains area.

Releases of water from storage reservoirs for irrigation are made in accordance with requests from the Northern Colorado Water Conservancy District. The Colorado State Engineer supervises distribution from the streams to the individual irrigation company headgates. These irrigation companies make deliveries to the land at the farm turnouts.

The history of the Colorado-Big Thompson Project dates back to about 1860. Around 1860 irrigation in the project area was first developed along the stream bottom lands. Then in 1870, the Union Colony, sponsored by Horace Greeley, constructed ditches from the Cache la Poudre River to bench lands in the vicinity of Greeley. The Union Colony irrigated 12,000 acres so successfully that other projects soon followed, utilizing water from the South Platte River, Cache la Poudre River, Big Thompson River, St. Vrain Creek, and Boulder Creek.

By 1900 the entire irrigated area had been developed and direct stream flow overappropriated. Soon thereafter an era of reservoir construction followed to store spring flood water for summer use. By 1910 most of the suitable reservoir sites had been developed. Residents then turned to an earlier dream of tapping the headwaters of the Colorado River for use on the Eastern Slope of the Rockies.

Finally in 1935, $150,000 of Public
Works Administration funds were allotted to the Bureau of Reclamation to conduct surveys and to report on the feasibility of water diversion from the West to the East Slope of the Rockies. The Northern Colorado Water Conservancy District was organized in 1937 to contract for the use of the project water and to repay irrigation costs.

In 1938 actual project construction began at Green Mountain Dam. Although work was slowed down considerably during World War II, water was delivered through the Alva B. Adams Tunnel to the Big Thompson River June 23, 1947; to the Cache la Poudre River in 1951; and to St. Vrain Creek in 1954.

Electric energy was first generated in May, 1943, at the Green Mountain Powerplant. The Big Thompson Powerplant, the last authorized feature of the project to be built, was completed and opened this last summer.

The complete project can be divided into six parts: 1. Western Slope replacement; 2. Western Slope collection system; 3. Alva B. Adams Tunnel; 4. Estes Park power system; 5. Estes Park-Foothills power system; and 6. Foothills storage and distribution system.

The Western Slope replacement has as its purpose to avoid interference with irrigation and power generation under prior rights on the Colorado River and to insure water for future expansion on the Western Slope. The Green Mountain Reservoir was constructed on the Blue River; here spring runoff is stored and later released to meet the requirements of the Colorado River, thus allowing diversion of more water by the project throughout the year. Green Mountain Powerplant produces power revenues to assist in repayment of project costs.

The Western Slope collection system traps runoff from the high mountains on the Upper Colorado River, stores, regulates, and transports it to the Alva B. Adams Tunnel. The principal storage feature is Lake Granby formed by Granby Dam, constructed across the Colorado River near Granby. Another storage feature is Willow Creek Reservoir from which water is transported 3.4 miles and lifted 175 feet to Lake Granby. Then the water is transported 1.8 miles and lifted 125 feet to Shadow Mountain Lake. This lake is formed by Shadow Mountain Dam, which was constructed below the confluence of the Colorado River and Grand Lake Outlet. The lake connects with Grand Lake to make (Continued on page 30)
Homecoming is always an important and anxiously prepared-for occasion at Rose. But the weekend of October 18, 1958 should be an occasion among occasions for Rose men. As most of us know this year's homecoming marks seventy-five years of operation for Rose and has been designated "The Diamond Jubilee Homecoming."

Perhaps it would be well to digress for a moment and review some of the history of the Institute and its founder.

Chauncey Rose was born in Connecticut, one of eight children. He had a meager education, and at the age of twenty three he traveled westward in search of a place to settle. He chose Terre Haute, and settled there in April, 1818. In 1819 he moved to Parke County and entered the lumber business. He moved back to Terre Haute in 1825 and became a popular and successful merchant. He judiciously invested his profits in land and eventually amassed a rather large fortune. Mr. Rose later became interested in railroads and was primarily responsible for the building of the Terre Haute and Indianapolis Railroad, and several other roads.

Mr. Rose contributed to nearly every church and civic endeavor in Terre Haute during his time. Throughout his life he was confronted by the problems of inadequate vocational and scientific training of the men who worked under him. It was only natural that late in life, when the question of disposing of his property arose in his mind, Mr. Rose decided to endow a "school of industrial science" to provide young men the knowledge that he and his associates paid so dearly for in the school of experience. So it was that Mr. Rose and his younger associates conferred and explored and decided how to begin what was then a novelty in this country; an engineering school.

The following is an excerpt from the Rose Polytechnic Institute Memorial Volume, published in 1909: "On the 10th of September 1874, articles of incorporation were adopted for the establishment of 'an institution for the intellectual and practical education of young men,' to be known as the 'Terre Haute School of Industrial Science,' and to be administered by a board of managers. On October tenth the board organized with Chauncey Rose, presi-
dent; Demas Deming, treasurer; and William K. Edwards, secretary. January 11, 1875, the cornerstone of the main edifice was laid with appropriate ceremony, and the name of the school was changed by the managers, over the protest of Mr. Rose, to Rose Polytechnic Institute. June 13th he resigned the presidency on account of age and infirmities, and died the next August."

Two things were unique about the beginning of Rose. First, Mr. Rose paid the construction bills as they came due, from his own funds. Second, the board of managers declined to open the school until enough capital had accumulated from the endowment to completely equip and furnish the new buildings. This took nearly seven years, so classes didn't start until 1883, seventy-five years ago.

The original buildings are at Thirteenth and Locust and are now part of Gerstmeyer High School. The school moved into its present site in 1922 and much advancement and construction has gone on here, especially in the last decade.

I am sure Mr. Rose would be very proud of the way his school has grown in quality and recognition, yet has stayed small in size, and conservative in outlook. It has outstandingly fulfilled its original purposes.

Now that we know why we are celebrating, let us examine further just how we shall celebrate.

On the spectacular side there will be the culmination of the efforts of the freshmen and all members of social fraternities in the bonfire and the fraternity displays. The freshmen are also gleefully readying Rosie for her trip through downtown Terre Haute. New this year is the Diamond Jamboree, entertainment to be held in the field house after the bonfire.

Of very solemn note is the Memorial Service for the late Dr. Wilkinson, to be held after the Diamond Jubilee Recognition on Saturday morning.

Also, there will be fraternity parties, campus open house, class reunion dinners, and many other events.

For convenience, a schedule of the weekend follows:

Friday, October 17
Campus Open House—Afternoon

(Continued on page 30)
DOES IT PAY?

FUEL INJECTION

By Larry Logue, sr., m.e.

When you pull up to a stop light and start looking over the competition in the next lane, you probably aren't surprised to see "Fuel Injection" spelled out in chrome letters across his fender. Do those chrome letters really spell some basic advantage over the carburetors under your hood, or is it just another expensive gimmick to make one car different from another?

First you might ask yourself a few other questions. Such as, just what is a carburetor and what is it supposed to do? The carburetor has three basic functions. They are metering the fuel and air to satisfy operating conditions, mixing fuel and air thoroughly and in the proper ratio, and acting as part of the passageway to get fuel and air into the cylinder. This makes the carburetor an important device since the power your engine develops depends on how much of this air-fuel mixture you can feed into the cylinders. Needless to say there are other factors involved, but the carburetor is an important link in the chain.

Carburetors have performed these functions quite adequately over the years, so what, if anything, is wrong with the carburetor-manifold type of system. In order to perform the three functions listed above the system must compromise on several points. Air-fuel ratios are fixed by the design and size of the jets, they cannot make small adjustments to provide the proper ratio for every operating condition. Only expanding choke type carburetors offer this feature and they are only applicable to side draft installations which are not practical on V-8 types of engines. Distribution of air and fuel through a multiple branch manifold entails certain losses and often often will starve one or more cylinders. This can be overcome by placing a carburetor on each cylinder, but this is expensive and often very unreliable. Cold weather starting characteristics are another complaint we find leveled against the carburetor. As the mixture enters the cold manifold, much of the fuel is condensed on the passage walls and never reaches the cylinders. If it does reach the cylinder as a liquid, it is very hard to ignite. Manifold heating will help this condition after the engine has begun to run, but reduces efficiency after operating temperature has been reached.

The biggest stumbling block in the path of the engineer is the cost and complication of existing fuel injection systems. Again it seems that a compromise must be reached between ideal operating conditions and practicality. This is the problem faces engineers in almost every new development.

In order to analyze the problem completely it seems advisable to consider fuel injection systems already in use. Fuel injection systems were first developed for use on diesel (compression ignition) engines. This was an obvious necessity since the only way that the ignition could be timed accurately was by timing the injection of the fuel. In order to provide timed injection a separate pump is required for each cylinder. These pumps are usually operated by a set of cams driven by the engine. The pump must also include a method of metering the amount of flow as well as timing the flow. It should be noted here that fuel metering must be closely matched with air metering in order that proper air-fuel ratios can be maintained at all times. To insure fault-free operation in systems of this nature, machining tolerances must be held to very close limits, and thorough periodic maintenance is a definite necessity. These factors make the cost prohibitive for passenger car use.

However, systems of this nature, using timed injection directly into the combustion chambers, have been successfully adapted to spark ignition engines. One of the most notable examples of this is the German Bosch system used by Mercedes-Benz. Engines equipped with this system produced amazing specific outputs and dominated European racing for a long time. This was a case of performance at any cost and is not applicable to present production techniques. The pump assembly used on the six cylinder engines costs between $500 and $1000 which definitely rules it out for normal passenger car use. These are interesting experiments and give the
Alpha Tau Omega

First and foremost in this Homecoming issue, Alpha Tau Omega wishes to extend a heartiest welcome to all our alumni and friends upon the occasion of the Rose Diamond Jubilee Homecoming. The traditional open house will be held on Friday evening, October 17, and the fraternity house will be open to visitors throughout the weekend.

Gamma Gamma is putting forth an extra special effort on the 1958 Homecoming display. Under the guidance of Ron Staggs and Louis Roehm, we are working on a maze of gears, gadgets, animals, mechanisms, etc. that would scare away Rube Goldberg.

The “Terrible Tau” football squad is warming up for interfraternity competition. We feel we can continue our winning ways that were begun last spring in softball. That softball trophy looks very nice on our mantle, but a football trophy would look even better up there with it.

Somewhat belated congratulations are in order to our Song Directors Jim Stott and Chuck Sechrest. Jim and Chuck led ATO to our sixth consecutive interfraternity song contest victory at the I-F Dance last spring.

The ranks of Gamma Gamma are expanding. Last May 25 fourteen new brothers were initiated. Then this fall we welcomed two new brothers from our DePauw chapter, Hal Booher and Jack Thompson. Hal and Jack are both juniors at Rose; they are engaged in the 5-year joint curricula program between Rose and DePauw. Two more pledges have also been added: Ed Ayres was pledged late last May and Ron Jennings was pledged September 9.

The ATO Auxiliary has grown, too. (This group is otherwise known as the wives’ club.) During the summer Jim Stott married Martha Nussell, Tom Reese married Nancy Waymire, Jack Smith married Judy Kirkham, Bob Dinning was wed to Doris Colyer, and Ernie Knoy was wed to Nancy Hengstler.

Only two pinnings took place over the long summer—Jim O’Donnell gave his pin to Miss Kay Nees and John Klotz lost his pin to Miss Carol Brown.

That seems to be all the news. Another school year has started, and Alpha Tau Omega has begun another great year.

Bill Perkins

Lambda Chi Alpha

Well, here we are again back at the old grind after a very busy summer. For some of the seniors the middle six weeks was especially eventful because that was the time for the ROTC Engineer Summer Camp. Those Lambda Chi’s attending from Rose were Dick Brown, John Davis, Gerald Gaskins, Hugh Griffin, Carl Herakovich, John Jardine, Don Johnson, Dan Mook, and myself.

Just before school let out last spring, two of the brothers received communications from the powers that be requesting them to report for pre-induction physicals. The fortunate ones were John Kennedy and Bill Brittain. However, not believing that the cause was lost they set out to see what they could do. They evidently found the right thing to do for they are still to be seen about the halls. But Senior Kennedy is heard to be muttering about getting into an essential industry quickly. (?)

The Theta Kappa chapter has been host this week to Traveling Secretary Deryle Enright. The traveling secretaries periodically visit Lambda Chi Alpha’s chapters to assist in solving problems, passing on new ideas, etc. Enright is a 1953 graduate of U.C.L.A.

President Dan Mook and Ritualist Marlan Hildenbrand were Theta Kappa’s delegate and alternate resp. to the 26th General Assembly held this August in Montreal, Canada. Iota-Iota chapter of McGill University was host to the gathering. The assembly meetings were held in the brand-new Queen Elisabeth hotel.

Brother Noble Huff took a big step this summer and took as his wife the former Miss Linda Link, now a student at Indiana State. Congratulations and much happiness, Nobe. Oh, by the way, he heartily commends married life to the rest of us bachelors.

Until next time then I remain your obedient servant,

Jim Barrick

(Continued on page 36)
Isotopes In Action

By James Funk, soph., chem.

If your employer asked you to develop a quick test method for determining how effective an oil is in preventing ring wear, how would you go about it? The obvious method of weighing the ring, running it in an engine lubricated with a test oil, then reweighing it, though used for many years, has been discarded as too time consuming. This procedure requires at least one hundred hours to obtain sufficient wear on which to base reliable conclusions.

Now compare your answer to the above question with the patented* test method developed by the Atlantic Refining Company of New Jersey.

The test set-up itself is not unusually complicated. Its main feature is of radioactive piston ring which has been exposed to a field of neutrons in an atomic pile such as the one of Argonne National Laboratories near Chicago. An extra neutron in a normal iron atom converts the atom to its radioactive isotope, iron 59.

Before exposure to the neutrons, the piston ring is a standard production-line product. The only stipulation is that the iron cannot be alloyed with certain elements, such as manganese, because they become so radioactive in the pile as to make handling too great a hazard. This radioactivity comes about because all elements possess a characteristic susceptibility to neutron fields. Their susceptibility is a function of the penetrable area of exposure offered by an atom to a high velocity neutron. The area of exposure is expressed as “barns”; one barn is equivalent to 10^-24 cm^2. Since the area of susceptibility is so high for manganese, it absorbs neutrons much faster than does iron, and by the time the iron has reached the desired point of radioactivity, the manganese is so radioactive that it poses serious handling problems. However, if the presence of a highly susceptible alloy is essential for a test, it may be used, providing special safety measures are observed.

The radioactive piston ring is then installed in a test engine. Depending upon the nature of the test, either a regular automotive engine or a special single cylinder test engine is used. In either case, power is absorbed at a stable rpm. by an engine dynamometer. The engine test oil is circulated through an oil sump in which a scintillator receives rod is inserted. The scintillator then graphically records the level of radioactivity in the oil.

As subocular particles of iron containing a certain percentage of iron isotope 59 are scraped from the ring surface, their concentration in the oil increases. The radioactivity level in the sump increases proportionally, as recorded on the scintillator in counts, per minute. Cpm. readings for the oil sump are then multiplied by a dilution factor to take into account all oil in the engine. Since this total cpm. is not truly indicative of the quantity of ejected particles, due to the half-life of radioactive decay of iron 59, it is expanded to the true value that would have been obtained had the isotope not diminished in radioactivity. Logarithmic radioactive decay curves simplify the expansion process.

The cpm. value so obtained, truly representative of ejected particle magnitude, is then divided by the expanded cpm. which was obtained for the ring before the test was initiated. The result is percentage ring wear for the particular oil on test. Percent ring wear multiplied by total initial ring weight yields the weight of the particles which were worn from* the ring. Expressed as a function of time, it is milligrams ring wear per hour.

As you may have guessed, not all ring particles accumulate in the oil. Some take the opposite route and are blown with the exhaust through the exhaust valve port. The amount of radioactivity lost is not detectable with a scintillator, which is quite sensitive, and consequently, is considered insignificant to test results.

To insure that the scintillator is functioning properly at all times, it is sporadically exposed to a sealed rod containing a fixed quantity of cobalt 60, and the cpm. is observed. Readings for this isotope should be relatively constant, even over a period of several months, for cobalt 60's half-life is 5.2 years.

Radioactivity within a test cell understandably presents a potential hazard.

*Royalty fee-$18,000

Page 16

THE ROSE TECHNIC
COMMENOMARATIVE
CONVOCATION

Rose's first convocation of the year was held to honor the memory of Dr. Ford L. Wilkinson Jr. and Keith M. Nelson.

Professor E. A. MacLean, chairman of the Convocation Committee, presided. Professor I. P. Hooper, Secretary of the Faculty, read the resolutions of the faculty concerning Mr. Nelson and Dr. Wilkinson. Keith M. Nelson, an instructor in chemistry for three years at Rose, was skillful, well trained, and imparted enthusiasm to his students. He was killed in an automobile accident on June 8, 1958, while on the way to do graduate work at the University of Montana. Mr. Nelson will be greatly missed by the friends he made while at Rose.

Rose suffered an overwhelming blow on the death of its President, Dr. Ford L. Wilkinson. Naval officer, engineer, teacher, Dr. Wilkinson was indeed an able administrator. During his ten years at Rose, the main building was remodeled, the Student Center built, a new dormitory completed, and the curricula enlarged. He will be remembered, not only as our beloved President, but as a courtly gentleman and a loyal friend.

Professor J. L. Bloxsome gave a brief biographical sketch of our late President. Dr. Wilkinson attended the University of Georgia for one year and in 1914 received an appointment to the Naval Academy. After graduation, he spent ten years as a commissioned officer and six years in industry before returning to college life in 1933 as Assistant Professor of Mechanical Engineering at the University of Tennessee. He received his M.S. from Columbia University and his Dr. of Engineering from the University of Louisville. He served as Dean at the University of Louisville and as Dean of the Post-graduate Naval School before coming to Rose in 1949. He has served as vice president of the national organization of ASME and in 1956 was voted outstanding engineer by the Professional Engineers of Indiana.

Bob Hall, speaking for the student body, recalled Dr. Wilkinson as the students remember him. He was a tactful, generous man with his door always open to students. All of us will miss him, but we should do our best to carry on his ideas and continue his programs.

Dean Herman A. Moench read from Dr. Wilkinson's inaugural address and recalled him as a man with a pleasing manner, a man with vision, a man who led Rose progressively forward during his ten year reign. His leadership inspired those about him and his memory (Continued on page 39)

Scenes of typical Freshman-Sophomore activities.
Several new faces have been noticed around the campus, not only in the student body, but also among the faculty.

Dr. Arthur W. Cambell is teaching part-time in the Chemistry and Chemical Engineering Departments while working in the Research Department of Commercial Solvents. Dr. Campbell received his B.A. at the University of Oregon and his M.S. and Ph.D. at State University of Iowa.

Dr. Wilkison Meeks in the Physics Department, received his A.B. from Maryweel College and his M.S. and Ph.D. from Northwestern University. Dr. Meeks comes to Rose from the B. F. Goodrich Research Center in Brecksville, Ohio.

Harold E. DeMun has joined the Humanities Department as Assistant Professor of Modern Language. He received his A.B. at Capital University, his L.L.B. at Ohio State University, his M.A. in French at Ohio State University, and his M.A. in Russian at Columbia University.

Dr. Simeon V. Galganaitis has replaced Dr. Howlett (retired) as head of the Physics Department. Dr. Galganaitis received his A.B. at Ripon College and his M.S. and Ph.D. at the University of Wisconsin. He has taught physics at the University of Louisville and Illinois Institute of Technology. He also has experience at Oak Ridge and the General Electric General Appliance Lab.

Carl D. Munselle received his B.A. and M.A. in English from Miami University of Ohio, and joins the Humanities Department after working on his Ph.D. and teaching at the University of Illinois.

Milton P. Danner, Rose '52, joins the Electrical Engineering Department after working as a field engineer with the General Electric Company at Cincinnati, Ohio. While at Rose Mr. Danner was active in sports, lettering in football his junior and senior years. He was also a member of the radio club.

(Continued on page 37)
The outlook for the 1958 gridiron giants of R.P.I. has been dimmed by the loss of several lettermen. This year's squad of 28 is the smallest Rose has had in several years. With the core of last year's conference champions, Rose can field a rough first eleven, but the bench is hurting for depth.

Captain Carl Herakovich, State leading scorer and tied for 4th in national scoring, will be leading an experienced backfield of G. Anderson and Bob Michael. Backing "Rocky" at right half will be freshman Joe Templeton and junior Harry Booher, transfer student for DePauw. Bob Michael is back at the left half spot with sophomore Bob Checkley helping out. The fullback position began to look weak when Terry Hallcom was sidelined for the season with a separated shoulder. However, with veteran Gary Anderson to fill in and Bill Yochum, ready to help out, this position may be one of the strongest on the team.

To date the weakest spot on the team is QB. Freshman Dave Lindzy and Bob McWilliams will be sharing the signal calling with Capt. Herakovich stepping in if needed. Lettermen Bart Gronberg, Tom Hornmuth, and Woody Stroupe are returning to the flank position; but with only inexperienced replacements, the ends could be a thorn in Coach Phil Brown's side. Freshman Jack Munro and soph. Jack Schreiner should help a lot as the season progresses.

Tackle is lacking in depth. Mike Munro is back this year after laying off last season with a bad knee injury, and two veterans, Ed Kostra and Bill Kuchar, are back ready to do a good job. Jack McAninch will be needed to help out at tackle also.

Barring injuries, guards are the strongest positions. Backing lettermen Al Raquet, Dick Pike, and Don "Tubby" Scott are three very promising freshmen: Larry Fahrenkamp, Dan Kingery, and Max Hutchens.

Dick Tucker will be snapping the ball again this year with veteran Chuck Gilbert giving relief. A shoulder injury has eliminated Gary Liffick, a freshman candidate, from the '58 season.

Phil Brown is looking forward to a fairly successful year if several key men hold up. Phil says, "You can be sure we'll show up every Saturday."

Let's all show up and pull the Engineers to another conference championship.

The Prairie Conference is still in existence although there are only three schools playing football. There is a new conference in the offering consisting of teams: Concordia, North Park, Eureka, St. Procopius, and Illinois College, all of which Rose will have played this year. All the schools will participate in basketball, baseball and track as well as football. Rose is the only one of these teams which will get to play

(Continued on page 37)
'98 John E. Hubbell, formerly a patent attorney in New York City, passed away December 14, 1957.

'12 Rufus C. Slocomb, recently retired from the Roadway and Track Division of the Baltimore and Ohio Railroad. He plans to return to his home in Vincennes, Ind.

'20 Whitcomb W. Moore, class representative with American Telephone and Telegraph has retired from his position with the company.

'28 Robert A. Thompson, ch.e., has been appointed assistant operations manager of Dravo Corporation's Contracting Division.

Serving with Dravo since 1928, Mr. Thompson was promoted from the position of field superintendent. As field superintendent he recently supervised all construction on the Taconite Harbor project on Lake Superior for Erie Mining Company.

Mr. Thompson, a member of the Registered Professional Engineers' Society of West Virginia. He is also a Sigma Nu fraternity member, and he belongs to several Masonic lodges including the Syria Shrine.

'28 Alfred L. Kasameyer, m.e., has been appointed superintendent of Detroit's Edison's building and properties department. He was previously an assistant in the department.

In 1929, after joining Edison in 1928 as a cadet engineer, he was assigned duties in the company's stores department and in 1935 was transferred to buildings and properties as technical engineer. His appointment to assistant superintendent came in 1954.

Mr. Gassameyer is married, and has two sons. He resides at 6320 Worlington, Birmingham, Michigan.

'38 Louis M. Eyermann has taken a new position as Mathematics teacher for du Pont Manual Training High School and Technical Legal consultant.

He was previously employed as a mathematics teacher and Technical Law Consultant at Fern Creek High School.

'46 Frank Jones has become manager of the new Wabash Municipal Airport. He graduated from Rose with a B.S. in Mechanical Engineering and is working at the University of Illinois in the Institute of Aviation.

'48 Mr. and Mrs. David Mitchell have recently returned from Oruro, Bolivia, where Mr. Mitchell was serving as division manager of the Bolivian Power Company, a subsidiary of the Canadian International Power Company. Oruro, a city of 50,000 people, 80 per cent Indian, is the center of Bolivian tin mining industry.

Mr. Mitchell was graduated from Rose in 1948, and Mrs. Mitchell is a graduate of Indiana State Teachers College.

'49 Paul Gottfried has been selected as a member of the Central Division of the Planning Committee of the Third Electronic Industries Association Conference on Reliable Electrical Connections.

His present job is the direction of large-scale electronic component and equipment reliability evaluation programs for Inland Testing Laboratories.

Mr. Gottfried is a member of The American Institute of Electrical Engineers, Institute of Environmental Engineers, and the National Society of Professional engineers.

Here at Rose he received a B.S. degree in Electrical Engineering.

'49 Change of address for Alumnus Aron Hagg, formerly of E. Orange, N. J., has moved to 1948 Driftaway Drive, St. Louis, Missouri.

'55 Funeral services for Ralph E. Branson were held August 20 at the Cross funeral home here in Terre Haute. He had been employed by General Electric Company as a jet engine designer.

A veteran of W. W. II, and a member of Tau Beta Pi fraternity, he was living in Cincinnati, Ohio previous to his death.

'56 Paul Lewis, recently moved to the University of Illinois campus for graduate study. Lewis, former Heminway Medal winner, was employed with the Interstate Electronics Corporation in California.

'58 Thomas T. Reese and the former Miss Nancy Waymire were married in the First Baptist Church in Indianapolis. When they return from their wedding trip to Bermuda, they will take up residence in Bloomington, Ind.

Mr. Reese will be working toward his masters degree in business administration at Indiana University.
It takes all kinds of engineers to do Western Electric's job

It is Western Electric's job in the Bell System to manufacture some 65,000 different parts which are assembled into a vast variety of telephone apparatus and equipment. This job, coupled with our other responsibilities as part of the System, requires the assistance of engineers in every field.

Their skills and talents are needed to develop new manufacturing techniques, solve quality control problems, determine machine and tool requirements, devise testing facilities and methods. They work on new applications for metals and alloys, calculate raw material needs, seek manufacturing cost reductions.

In helping meet the Bell System's need for more and better telephone equipment, Western Electric engineers have assignments in the other areas of our job—installation, distribution and purchasing.

Our engineers are also deeply involved in defense projects entrusted to us by the government. Because of our specialized experience as part of the Bell System we are well equipped to handle the job. Among these projects: the Nike guided missile system and the White Alice communications network in Alaska.

Of course, Western Electric engineers are encouraged and assisted in developing professionally... in expanding their technical know-how. Company-sponsored programs—like the full-time Graduate Engineering Training Program and the Tuition Refund Plan—help them along.

Promotion from within—a Western Electric policy—helps many of our engineers move into positions of prime responsibility. Today, 55% of the college graduates in our upper levels of management have engineering degrees. In the next ten years, 7,000 key jobs must be filled by newly promoted people—engineers included.

Western Electric technical fields include mechanical, electrical, chemical and civil engineering, plus the physical sciences. For more information pick up a copy of "Consider a Career at Western Electric" from your Placement Officer. Or write College Relations, Room 1111D, Western Electric Company, 195 Broadway, New York 7, N. Y. And sign up for a Western Electric interview when the Bell System Interviewing Team visits your campus.
ISOLATION—Ten square miles comprise the site of Pratt & Whitney Aircraft's new Florida Research and Development Center. Experimental shops and offices covering some 17 acres are in the foreground, while the tests areas, barely visible in upper left, lie four miles in the background.

LOCATION—The new Center is located at United, Florida, midway between West Palm Beach and Lake Okeechobee, in the upper Everglades area. It is almost surrounded by a wildlife sanctuary. Most employees live in the cities and towns along the east coast of Florida, driving to the Center on excellent new highways.
Another Unmatched Engineering Facility to Advance Propulsion Systems of the Future

Future aircraft and missiles may require propulsion systems far different from those in wide use today — different in size, power output, appearance, and perhaps even in the basic method of utilizing energy.

To probe the propulsion future . . . and to build and test greatly advanced propulsion systems for coming generations of flight vehicles, Pratt & Whitney Aircraft is now operating its new Florida Research and Development Center. This facility supplements Pratt & Whitney’s main research and development installations in Connecticut.

The new Florida Center, financed and built by Pratt & Whitney Aircraft, is unique in America’s air industry. Here a completely air-conditioned plant with 17 acres under roof is specially designed and equipped for the development of new power plants of virtually any type. Testing is handled in special isolated areas; the nearest is four miles from the plant and many miles from any inhabited area. The new Center can be greatly expanded on its 10-square-mile site. Continued isolation is insured by a vast wildlife sanctuary in which the Center is located.

Of the many people employed at the Center today, about half are scientists, engineers and highly trained technicians. By late next year, the total number is expected to be almost doubled.

The new Florida Research and Development Center is one more reason why Pratt & Whitney Aircraft is able to continue producing the world’s best aircraft propulsion systems . . . in whatever form they take.

For further information regarding an engineering career at Pratt & Whitney Aircraft, contact your college placement officer.

PRATT & WHITNEY AIRCRAFT
Division of United Aircraft Corporation
CONNECTICUT OPERATIONS — East Hartford
FLORIDA RESEARCH AND DEVELOPMENT CENTER — United, Florida
ATLAS PROPULSION SYSTEM

The propulsion system for the 15,000 m.p.h. Air Force Convair Atlas intercontinental ballistic missile is the most powerful system in the free world to enter flight test and production.

It is a cluster of liquid-propellant rocket engines. It consists of a twin-chambered booster engine, a sustainer engine for high-altitude efficiency, and two small stabilizing engines.

The system was designed and developed for the Atlas missile by Rocketdyne, a division of North American Aviation, Inc., and is in production at the division’s main plant in Canoga Park, Calif.

Work on the Atlas propulsion system began by Rocketdyne in March, 1954. The system’s original design was based on then existing technology, developed largely by early North American long-range missile research. Subsequent studies led to the early incorporation of major design and manufacturing refinements.

The first flyable system was delivered on schedule to Convair in June, 1956, and initial flight test came one year later, using booster and vernier power only.

Subsequent engines of the series have incorporated the latest technical advances developed in static and flight tests. The complete propulsion system, including sustainer, had been thoroughly ground tested by Rocketdyne and Convair for a year and a half before entering flight test this year.

Each rocket engine in the Atlas propulsion system is designed to perform a specific job. The twin-chambered booster engine provides high thrust to lift the heavy missile from its launching site. It is jettisoned after operating for its programmed duration, when it has boosted the Atlas to high speed and high altitude.

The single-chambered sustainer, designed for efficient high-altitude performance, supplies the slightly lower thrust necessary to sustain powered flight and to keep the Atlas on course in the thinner air of the fringes of space.

Directional stability of the missile is maintained by swiveling the large engines of the propulsion system on gimbals—a part of their assembly—and moved by struts actuated by the guidance equipment of the missile.

Roll control is provided by the propulsion system’s vernier or stabilizing rocket engines, small auxiliary units for precise thrust adjustments. They are mounted on the side of the missile and are also gimbaled for movement.

All engines of the Atlas propulsion system develop thrust from the propulsive gases created by the combustion of liquid oxygen and RP-1, a hydro-carbon fuel similar to that used in turbojet engines. Combustion occurs at temperatures above 5,000 degrees F. Thrust chambers of the engines are cooled to withstand the heat by RP-1 fuel streaming through their hollow walls. The fuel is forced at high speed through the walls and into the combustion area by the engine’s high-flow, lightweight turbopump.

ELECTRONIC HIGHWAY OF TOMORROW

A segment of the “electronic highway of tomorrow” is in operation at the David Sarnoff Research Center of the Radio Corporation of America at Princeton, New Jersey.

Cars entering the grounds of the research center, headquarters of RCA Laboratories, pass over electronic loops buried in the entrance road. Transistorized detector units connected to the loops count each of the passing cars, measure the speed of each, and flash a polite warning saying “Slower Please” to every driver exceeding the posted speed limit.

The new equipment is a transistorized variation of the comprehensive electronic vehicle control system developed earlier by RCA and demonstrated last year at Lincoln, Nebraska, in cooperation with the Nebraska Department of Roads. At Lincoln, the system showed its ability to guide cars automatically along the highway and to provide electrical signals for the automatic control of braking and steering.

The new installation put into operation is designed to demonstrate further immediate applications of the system in specific traffic control jobs.
AiResearch engineered and produced this electro-hydraulic servo system—the most reliable and responsive steering control system for missiles yet produced. Extremely lightweight, it consists of three control valves and six actuators.

This unique system represents but a part of the challenging, important work under way at AiResearch in missile, electronic, nuclear, aircraft and industrial fields.

Specific opportunities exist in system electronics and servo control units; computers and flight instruments; missile auxiliary power units; gas turbine engines and turbine and air motors; cryogenic and nuclear systems; pneumatic valves; industrial turbochargers; air conditioning and pressurization; and heat transfer, including electronic cooling and nuclear applications.

Intensified engineering is conducted by small groups where individual effort and accomplishment are quickly recognized, providing opportunity for rapid growth and advancement. An eight-month orientation program is offered prior to permanent assignment to help determine your placement from a variety of analytical or development projects.

Advanced education is available through company financial assistance at outstanding nearby universities.

*For full information write to Mr. G. D. Bradley*
Now you can see why only leads & pencils give you perfectly graphite like this

100% "electronic" graphite + superfine clay = makes this lead structure

You always get proven quality from Turquoise drawing leads and pencils

**Proven Grading**—17 different formulae make sure you get exactly the line you expect—from every pencil, every time.

**Proven Durability**—Because compact lead structure gives off no chunks of useless "dust" to blow away, Turquoise wears down more slowly.

**Proven Needle-Point Strength**—As electron photomicrograph shows, Turquoise lead structure is finer—and therefore stronger. It holds a needle point under drawing pressures for long lines of unchanging width.

Eagle Pencil Company • New York • London • Toronto • Mexico • Sydney • Bogota

Page 26 The Rose Technic
Eagle Turquoise
sharp drawings

Relatively large, irregular particles of graphite make a rough-edged line. Drawings will be inferior.

Tiny, more uniform particles deposit as a clean-edged, solid line. Drawings will be perfectly sharp, clearly defined.

WRITE FOR FREE SAMPLE DEMONSTRATION KIT
(including Turquoise wood pencil, Turquoise lead, and Turquoise "skeleton" lead) naming this magazine. Eagle Pencil Company, 703 East 13th Street, New York, N. Y.

EAGLE®
TURQUOISE®
PENCILS AND LEADS
are the largest-selling in the United States!
Our library has certainly gone up in the world since last June. Of course we are referring to the second level of steel stacks which was installed during the summer vacation. This expansion should take care of our needs for shelving space for many years to come. The only space problem that we will have to worry about now is seating space for our library users. We express our most sincere apologies to all of you for any inconvenience this necessary expansion project may have caused. We promise you the best of service in the future as we have plenty of room in which to make all of our resources readily available for your use.

FROM THE NEW BOOK SHELF

Inside Russia Today, by John Gunther

This important new book is written in the form and manner that Mr. Gunther has made his own, and which the earlier “Inside” volumes have made famous — that is, it is authoritative and comprehensive, and at the same time immensely readable; vast in scope, yet intimate; written with zesta; packed with drama, color, personality, and a wealth of anecdote.

It is also an eye-opener. Scrupulously objective and fair-minded, Inside Russia Today cuts through partisanship and shows us the Soviet Union for what it really is, with all its puzzles and complexities. It takes the reader inside this continent-size country and reveals it geographically and historically, as well as in political, industrial, scientific, military, and above all human terms.

Here are the sights and sounds of Russia, the weather, the food, the essential atmosphere. Here are personal glimpses of every sort of Russian in almost every walk of life. Chapters on the theater, the ballet, sports, women, aviation, religion, crime, and the law are full of fresh and fascinating information. Here, above all, is the new, post-Stalin Russia, in which monolithic rigidity has been replaced by something much more fluid, experimental, dynamic and, perhaps, more dangerous. The extraordinary Soviet advances in science and education are documented and described with a wealth of detail available in no other book.

Inside Russia Today will have a profound effect in awakening Americans to what is happening in the Soviet Union. It is certainly one of the most illuminating studies ever written about any country, as it is one of the timeliest and most useful. This book is essential reading for everyone who hopes to understand the struggle for power and the chances for peace in today’s world.

SAC: The Strategic Air Command, by Richard G. Hubler

In this book for the first time the whole story of the Strategic Air Command of the United States Air Force is told.

SAC is possibly the most efficient and far-reaching fighting machine ever created — in order to insure that there will be no fighting. It holds the most destructive power ever known — in order to guarantee that it will never be used. It has bought nearly a dozen years of peace for the United States, and perhaps the world, at a total cost of nearly 20 billions of dollars — yet it cannot guarantee an hour of it. Every day SAC prepares for war so that the peace may last indefinitely.

Richard G. Hubler, in telling the complex and absorbing story of SAC, has managed to compress into a readable narrative a tremendous amount of information and interpretation. Readers of this book may feel that for the first time they can grasp the importance, the function, the power, and the life-saving promise of America’s mightiest military command.

To accomplish the brilliant feat of telling the whole story in clear and compelling fashion, the author has had to have the co-operation of key figures not only in SAC but in other major commands and in USAF headquarters.

The facts have been carefully checked, page by page, by responsible USAF officials. Though this history must for obvious reasons be classed as “unofficial” at this time, it is likely to remain for many years the definitive, factual, source book and survey of the Strategic Air Command.

The Titans, by Andre Maurois

(Continued on page 36)
Don't forget the "extras" of an employee benefit program when you compare the job offers and salaries of different companies. At Du Pont, these extras mean added income that doesn't always meet the eye. They include life insurance, group hospitalization and surgical coverage, accident and health insurance, pension plan and paid vacation.

In addition, the Company sponsors a thrift plan. After two years of service, for every dollar you invest in U. S. Savings Bonds the Company sets aside 25 cents for the purchase of common stock in your name. Roughly, 60,000 of our employees are now participating in this plan.

If you have specific questions on Du Pont benefits, just send them to me. I'll be happy to try to answer them. E. I. du Pont de Nemours & Co. (Inc.), Room 12421 Nemours Building, Wilmington 98, Delaware.

The location of your first assignment with Du Pont depends on your qualifications and on the openings in your field, but every effort is made to match the job and the location with your preference. The chances for a successful match are good.

Today there are men and women carving out careers with Du Pont at more than 75 plants and nearly 100 laboratories spread throughout 26 states. Last year the Company spent $220 million for new plants and for increased capacities at existing installations. This year new plants have already been put into operation in Virginia and Michigan. Six more are under construction. Others are planned for the near future.

Most Du Pont units, it is true, are located east of the Mississippi. Company headquarters, for example, along with many labs and plants, are located in and around Wilmington, Delaware, which is a pleasant residential area within easy reach of Washington, Philadelphia and New York. But there are also plants and laboratories in California, Iowa, Kansas and Texas, and plants in Colorado, Missouri and Washington.

Wherever you're assigned, you'll be proud of the Du Pont Company both on and off the job. You'll find the people you work with friendly, stimulating, and active in the life of the community.
a single body of water through which diverted water flows by gravity to the Alva B. Adams Tunnel.

The tunnel, a concrete-lined cylinder, is 9.75 feet in diameter and has a capacity of 550 cubic feet per second. The tunnel was constructed entirely from the two ends, each of which lies outside the Rocky Mountain National Park boundary. A 69 KV transmission line in a nitrogen gas-filled pipe suspended from the roof of the tunnel connects East and West Slope power facilities.

From the east portal of Adams Tunnel the water is conveyed through Aspen Creek Siphon and Rams Horn Tunnel, then dropped 205 feet through a penstock 96 inches in diameter to Mary’s Lake Powerplant. The water then goes through Prospect Mountain Pressure Conduit and Tunnel and drops 482 feet through three penstocks 78 inches in diameter to Estes Powerplant.

In the Estes Park-Foothills power system the water is conveyed from Lake Estes through Olympus Siphon and Tunnel and Pole Hill Tunnel and Canal, then dropped 815 feet through a penstock 96 inches in diameter to Pole Hill Powerplant. The water then goes through Rattlesnake Tunnel and Reservoir, and Bald Mountain Pressure Tunnel, and drops 1055 feet through two penstocks, varying from 84 to 72 inches in diameter, to Flatiron Powerplant. This powerplant discharges into Flatiron Reservoir which regulates the water for release to the Foothills storage and distribution system.

The Foothills storage and distribution system spreads out both north and south from Flatiron Reservoir. South the system includes Carter Lake, the St. Vrain Supply Canal, the Boulder Creek Supply Canal, and the South Platte Supply Canal. North the system includes the Horsetooth Feeder Canal, Horse-tooth Reservoir, Big Thompson Powerplant, Dixon Feeder Canal, and the Boulder Creek Supply Canal, the South Platte Supply Canal, and the North the system includes the Horsetooth Feeder Canal, Horse-tooth Reservoir, Big Thompson Powerplant, Dixon Feeder Canal and Canal. North the system includes the Horsetooth Feeder Canal, Horse-tooth Reservoir, Big Thompson Powerplant, Dixon Feeder Canal, and the Boulder Creek Supply Canal, the South Platte Supply Canal, and the South Platte Supply Canal. North the system includes the Horsetooth Feeder Canal, Horse-tooth Reservoir, Big Thompson Powerplant, Dixon Feeder Canal, and the Boulder Creek Supply Canal, the South Platte Supply Canal, and the South Platte Supply Canal.

(Continued on page 42)
Engineering leadership—a bench mark at Alcoa

In exciting new architectural developments . . . in the automotive industry's drive for the all-aluminum engine . . . in super conductors to meet the nation's insatiable power demands, you'll find Aluminum Company of America in the forefront of technological advances. Alcoa produces and sells nearly one-half of the nation's aluminum . . . conducts about three-quarters of all basic research on aluminum applications . . . maintains the world's largest and most completely equipped light metals research center at New Kensington, Pennsylvania.

To maintain this type of leadership, we need outstanding men, men with top backgrounds in both academics and extra-curricular activities. Men who are trained in the nation's top schools . . . who understand and glory in the challenge of engineering . . . who know that therein lies the basis of a better tomorrow. Today, aluminum serves virtually every area of our industrial, commercial and day-to-day lives. Yet its uses have only just begun to be exploited. Your challenge as an engineer lies in finding new applications, in bringing aluminum to its full potential as a servant of mankind.

Whatever your specialty—metallurgical, mechanical, electrical, industrial, or any other type of engineering—whatever your interest—in engineering, production, research, development or sales—there's a clear-cut future for you at Alcoa. Write us today—just fill out the coupon—for your copy of A Career For You With Alcoa. Or contact your campus placement director.

Please send a copy of A Career For You With Alcoa.

Aluminum Company of America
1825 Alcoa Building
Pittsburgh 19, Pennsylvania

NAME
STREET ADDRESS
CITY AND STATE
COLLEGE DEGREE
DATE OF GRADUATION

Your Guide to the Best in Aluminum Value
"ALCOA THEATRE"
Exciting Adventure, Alternate Monday Evenings
Which of the following are practical applications of COPPER or COPPER ALLOYS?

- 1. Ship fittings.
- 2. Television antennae.
- 3. Heat sinks for missile nose cones.
- 5. Prefabricated plumbing lines.
- 6. Pipelines for sodium hydroxide.
- 10. Gold-plated jewelry.

Now try your hand at these True-False Selections:

- 11. Proved copper reserves have decreased in the last 20 years. □ T, □ F.
- 12. On the machinability rating scale, Free-Cutting Brass rates 100. □ T, □ F.
- 13. The green patina of copper can be developed artificially. □ T, □ F.
- 14. Copper and copper alloy parts should be joined only by riveting. □ T, □ F.
- 15. Nickel Silver is an alloy of nickel and silver. □ T, □ F.

1. Yes. Copper, and many of its alloys, have excellent resistance to salt water corrosion.

2. No. The important properties of copper are not needed and lighter, cheaper metals are usually used.

3. Yes. Copper's high heat conductivity protects the delicate instruments inside by quickly dissipating the surface heat of re-entry.

4. Yes. Architectural bronze extrudes readily and is used for a wide variety of architectural shapes.

5. Yes. Because copper tubing can be easily and firmly soldered, it lends itself well to prefabrication. The few unassembled joints are soldered on the site, eliminating the use of threaded fittings.

6. Yes. Copper-nickel alloys have good resistance to many alkalies and are often used in contact with them.

7. Yes. Large vanes of copper are blackened and mounted on a roof to collect the sun's rays. The high thermal conductivity of copper makes it very efficient for this use. The copper carries the heat to a circulating water system.

8. No. The conductivity of copper and its alloys is too high for this purpose.
9. Yes. Here the current is introduced through the electrodes to the parts to be welded. Several copper alloys are well suited for this use because of their high strength at elevated temperatures.

10. Yes. The low-zinc brasses are easily worked and are readily plated for high-quality costume jewelry. Most copper alloys lend themselves well to polishing and plating.

11. False. Reserves have increased. Published figures are no indication of long run availability or total mineral deposits. The industry lists only those reserves which have been “proved” for immediate development. Since the copper industry has grown in these years, so, too, have the proved reserves. Future copper supplies are vastly greater than any known “reserve” figures would indicate.

12. True. Free-Cutting Brass usually can be turned at maximum spindle speed and many other copper alloys at high speeds. A large number of copper alloys are available for easy machining.

13. True. The Copper & Brass Research Association has developed a spray process which has been successfully used to give architectural and ornamental parts an attractive green patina much faster than nature would do it.

14. False. Good joints between copper or copper alloy parts can be made by soldering, brazing or welding.

15. False. The Nickel Silvers are copper alloys. They derive their name from their silver-like color. A typical composition is 65% copper, 18% nickel, 17% zinc, and no silver at all.

The copper alloys, of which there are more than forty that are standard and many more that are special in current use, have many properties just as unique as this “silver” that isn’t silver. If you’d like to learn more about them, or if you really flunked this quiz, send for your copy of “A Guide to Copper and its Alloys.” The Copper & Brass Research Association, 420 Lexington Avenue, New York 17, N. Y., will be happy to supply it.

“A GUIDE TO COPPER AND ITS ALLOYS”

28-page booklet issued by the Copper & Brass Research Association covers the Coppers, Brasses, Bronzes, Nickel Silvers and special alloys. The histories, properties and applications of each class of metals are reviewed in the illustrated text and tables. Write for your copy. Address Copper & Brass Research Association, 420 Lexington Avenue, New York 17, N.Y.
FUEL INJECTION
(Continued from page 14)

engineer a foundation upon which to base further study.

The first application of this type of injection system to spark ignition engines was on aircraft powerplants. The radial aircraft engines have a very pronounced fuel and air distribution problem. Use of a centrally located carburetor involves long and inefficient manifolding. In an attempt to simplify the design, the Italian, Fuscaldo system was developed. This system involves the use of electric solenoid operated injector nozzles mounted at each cylinder in place of the general mechanical pump. The timing is then by a distributor similar to the ignition distributor. Separate controls are then necessary to control the duration of the injection and the by-pass valve at the main supply pump. On this particular system the injection is not directly into the cylinder but is into the intake port, just above the valve. This design proved to be simpler and cheaper than the diesel type, but is still considered too complicated and expensive for passenger car use.

At the other end of the scale we find the most simple type of fuel injection. This type is best illustrated by the injection systems found on most American racing cars. The Hillborn injector, designed for the Meyer-Drake engine, is a continuous flow, port injector. It consists mainly of a short section of tubing fitted with a butterfly valve and an injector nozzle. All the injectors are fed by a single engine driven pump which meters the fuel according to throttle opening. This system has been quite successful on engines which are required to operate over a narrow range of speeds and throttle opening conditions, but has not proved practical for engines which must idle well and perform well under a wide variety of conditions. So, despite its inherent simplicity, it still does not measure up to the requirements for general automotive use.

Now we have seen that there are a number of systems already in use which are satisfactory for their respective purposes but not for passenger cars. As was mentioned at the beginning of this article, fuel injection has become available on several of the popular makes of cars. What changes have been made in the older systems and what new ideas have been incorporated to bring fuel injection within reach of the common man? For some of the answers to these questions suppose that we take a closer look at the particular type which was developed by the General Motors engineering staff and is now being used by Chevrolet and Pontiac.

For this system the continuous flow, port injection arrangement was chosen for its obvious simplicity and economy of manufacture. As we shall see, however, it differs greatly in many respects from the continuous flow system described above. It is quite naturally a compromise between the simplest and the most complicated types which have already been developed.

The first important area considered in this design is the choice of a method of metering fuel and air. Two methods were considered: (a) the engine speed-air density method and (b) the mass flow method. The engine speed-air density method is widely used in aircraft applications due presumably to the wide range of air density encountered in aircraft operation. This method requires a device which can sense absolute temperature and absolute pressure quite accurately and a device which can interpret this information and transmit it to the metering controls. Another factor necessary in this method is a device which senses a function of volumetric efficiency vs. engine speed and feeds this to the metering controls. These intricate controls make this method very sensitive but also very expensive, so that it was discarded in favor of the mass flow method.

The method used bases its metering on pressure change in a high-efficiency venturi, which is a function of the mass flow of air into the engine. In this case the volumetric efficiency of the engine is sensed by the venturi, eliminating the need for a separate sensing device. The air-fuel ratio in the GM system is proportional to the square root of the ratio of venturi pressure to fuel pressure. The mechanical linkage of the fuel metering system varies the air-fuel ratio to cope with the requirements of various throttle openings ranging from a part throttle to a maximum power figure of 12.5:1 at full throttle.

To insure that the amount of fuel injected is always proportional to the fuel pressure, air is supplied at atmospheric pressure to a point near the injectors eliminating pressure variations due to changing manifold vacuum. The nozzle is also designed so that the fuel is cooled by evaporation, greatly reducing vapor bubbling problems. A spill plunger takes care of the extra rich mixture required at idling conditions which is not supplied by the regular metering system.

Having discussed the main features of this system it is also interesting to consider some of the smaller features of importance. Due to the small inertia of the mechanical linkage, throttle response is nearly instantaneous, eliminating any need for an accelerator pump to fill the gap until the main system catches up with the change in conditions. Since the fuel is injected directly into the ports, little mixture enrichment is needed for starting. What enrichment is required is supplied by a solenoid which moves the ratio adjusting linkage to the required position. A special Coasting Shutoff valve eliminates the collection of unburned fuel in the exhaust system.

In conclusion we return to our original question of fuel injection vs. carburetors. We have found that the fuel injection system has much to offer and may well eliminate the problems associated with carburetors. But, we also find that fuel injection is still definitely in the development stage and has many problems of its own to work out before it is entirely satisfactory for general use.
Allis-Chalmers offers training course

In nucleonics, Andrew Selep, Brooklyn Polytechnic Institute, BME '53, is working on the problem of reactor safeguards.

Special engineering by Paul W. Clark, Iowa State College, EE '49, is of large job involving combined electrical equipment.

Sales manager, Robert Horn, Marquette University, EE '51, heads sales of voltage regulators used on power lines.

Electronics man, William E. Martin, Alabama Polytechnic Institute, BSEE '53, engineers applications of induction heaters.

plus wide choice of type and fields of

Design of generators for steam turbines is directed by G. W. Stoats, Illinois Institute of Technology, Ph. D. '56.

Field sales of America's widest range of industrial equipment is career of Carl E. Hellerich, U. of Nebraska, ME '49.

Promotion man, Robert I. Carlson, Worcester Polytechnic Institute, ME '50, directs promotion of switchgear and substations.

Application and sales of steam condensers for power plants are handled by William E. Ellingen, U. of Wisconsin, ChE '49.

work on equipment for many industries

The outstanding training course started by Allis-Chalmers has proved a springboard to many worthwhile careers. In fact, most of the A-C management team has stemmed from its ranks.

Up to two years of theoretical and practical training are offered. This experience leads to jobs in research, design, manufacturing, application and sales.

Even though you may not know exactly what you wish to do, the Allis-Chalmers training course is designed to help you find the type of work and the field to which you are best suited.

ALLIS-CHALMERS
ISOTOPES IN ACTION
(Continued from page 16)

damaging effect on personnel health, augmented by the fact that the physiological presence of iron 59 is accumulative. Chemical properties of the isotope are identical with those of the atom in that the former can be used as a building block in the formation of hemoglobin in the blood. In this form, the isotope is free to wreak havoc with body tissue until it is expeled in the natural cell life cycle. To combat these health hazards, the Atomic Energy Commission has dictated strict precautionary measures.

To start with, a company may use the facilities of an atomic pile for irradiation of a part, such as a ring, only after the AEC has approved a report stating the nature and purpose of the work to be done. The company's radioactive laboratory layout is inspected to insure that the radioactive material can be stored, used, and disposed of safely. The organization must also employ a qualified health physicist to insure that all safety measures are observed.

When piston rings are shipped to an atomic pile for treatment, they are accompanied by a chemical composition sheet. If such were not the case, an alloy ring containing an element highly susceptible to the bombardment of neutrons might slip by and would become active enough to injure anyone handling the ring.

Special long handled tools are used in installing radioactive rings since the quantity of radiation received from an object varies inversely with the square of the distance from it. To determining the amount of radiation to which a person has been exposed, film badges, checked monthly by the AEC, are worn. The film, which develops according to the intensity of radiation received over a period of many years, poses only a questionable threat to health. Recognizing this, the AEC has arbitrarily established .3 roentgens per week as the maximum any individual may knowingly receive. If through accident a person receives a dose greater than the maximum, he is not permitted to work the area of radioactivity until enough time has lapsed to make his average exposure less than the specified .3 roentgens per week.

Many laboratories, realizing the impossibility of harmful effect even at the specified "safe" level of radioactivity maintains their own standards, safer than those of the AEC. The Pure Oil Research & Development Center in Crystal Lake, Ill., for example, does not permit its employees to absorb more than 20 milliroentgens per week. The Pure standard is only 1/15 of the AEC recommended level, and is roughly equivalent to the radiation one would receive in wearing a radium-dialed wristwatch. At the Pure Research Center, no one is allowed to work in the radioactive test cell longer than 2 hours per day. Further, on smoking is allowed in the area, since a person's hands could become contaminated with a radioactive particle from a tool or a part. The particle could be transmitted to a cigarette and inhaled into the lungs with smoke. For a similar reason, eating is prohibited as well.

To insure that contamination is not carried by personnel outside the test cell, their persons must be checked by a geiger counter as they leave the room. Also, notes used on the test engines are not allowed to be taken from the test cell.

To provide a final check that all the above described safety measures do their job, personnel working on the radiarction test are given free medical examinations periodically.

Radioactive traces are daily finding new applications both in research, as described in this article, and in industry, with practically no danger to personnel health.

As the engineers of tomorrow, we should constantly keep our minds open to the creative possibilities of "doing it with isotopes."

LIBRARY NOTES
(Continued from page 28)

The first Alexandre Dumas was a giant mulatto, a nobleman's son who became one of Napoleon's generals. He hurled his troops over enemy barricades by the seats of their pants; his exploits as lover, fencer, horseman and fighter made him a legend in his own time.

His son, author of The Count of Monte Cristo, The Three Musketeers, and scores more of novels, plays and memoirs, by his own boast fathered more than five hundred natural children throughout Europe. His Herculean energies overflowed into cooking, politics, warfare and intrigue.

The third emulated the literary fame of his father with novels and theatrical successes, including The Lady of the Camellias. His numerous mistresses and romantic involvement belied his public pose as moralist. An unhappy marriage and the pursuit, all the way to Russia, of an elusive amour were reflected in his curious attitudes toward women.

All three of these spectacular men were named Alexandre Dumas. Their lives span a century that began with the French Revolution and passed through all the excesses, vanities and splendors that were France's until the twilight of the nineteenth century. It is a fascinating epoch which Andre Maurois has explored in many books and biographies and of which he is the acknowledged master. To The Titans he brings not only an immense understanding of the times but the fruits of prolonged research into newly available material.

The subjects of this narrative of three generations all have tremendous vitality, humor and humanity. Their careers were touched with tragedy as well as triumph, but no misfortunes could diminish the vigor of their personalities or the brilliance of their genius. In Mr. Maurois, himself a pre-eminent figure in the world of letters, the three Dumas — le General, pere and fils — have found a matchless and sympathetic biographer.

THE ROSE TECHNIC
MEET THE FACULTY
(Continued from page 18)

Joseph G. Moser, Rose '55, after completing work on his M.S. in mathematics at Purdue is dividing his teaching between the Mathematics and Electrical Engineering Department.

John C. Hegerty has joined the physics staff after receiving his B.S. from Boston College and his M.S. at the University of Maryland.

Major Fred E. Jones graduated from West Point and received his Masters in Civil Engineering from Harvard. He has recently returned from Germany where he served as an Army Area Engineer.

The student body joins the faculty in welcoming these new men to the Rose faculty.

LOCKER RUMORS
(Continued from page 19)

the other five, because of scheduling difficulties. The name of the conference is still undecided, but its formation is a big step forward for small colleges.

Intramurals
The battle for the all intramural trophy is in full swing. The trophy, which was won by the seniors last year, is in the lobby of the field house for those who care to see it.

The tough football league began September 23 with 8 teams entered. The whole student body wants to play this year because the faculty is entering a team. Look out, professors! After the first round of football, there is the possibility of a round of soccer.

The interfraternity football league should be a fight to the finish. Theta Xi has won the league for the past two years and already has one win under its belt this year, beating Sigma Nu 7-0 September 21. If they win the trophy this year, they will retire it. ATO won its first game against Lambda Chi, 24-6. At the end of the season, each team will have played 6 games.

For a little variety, there will also be single and doubles tournaments in tennis and horseshoes. At one of the home games the intramural director, Max Kidd, is planning a cross country meet.

Badminton and volley ball courts have been set up for those who want exercise. The tournaments will not be scheduled until later.

Football—1958
Sept. 27, St. Procopius at Lisle, Ill.
Oct. 4, North Park College at Chicago, Ill.
Oct. 11, Eureka College
Oct. 18, Concordia College
(HOMECOMING)
Oct. 25, Franklin College at Franklin, Ind.
*Nov. 1, Illinois College
*Nov. 8, Principia College
Nov. 15, Earlham College at Richmond, Ind.

*Conference Games
Home games start at 1:30 P.M.
Young Engineers with a Future

Each day the engineers pictured below solve problems involved in energy conversion, transmission, distribution and application of power for the expanding American Electric Power System.

These engineers are representative of over 800 who work in eight states on the stimulating and challenging problems faced by our growing system.

To find out about career opportunities available to YOU at AEP, be sure to read our 24-page brochure “Join the Company that Makes the News!” It’s at your placement office . . . or write for your own copy to any of the addresses listed below, attention:

Employe Relations Department.

American Electric Power Service Corporation, 30 Church Street, New York 8, N. Y. • Ohio Power Company, 301-315 Cleveland Avenue, S.W., Canton 2, Ohio • Indiana & Michigan Electric Company, 2101 Spy Run Avenue, Fort Wayne 1, Indiana • Kentucky Power Company, 15th Street and Carter Avenue, Ashland, Kentucky • Wheeling Electric Company, Wheeling, West Virginia • Appalachian Power Company, 40 Franklin Road, Roanoke 9, Virginia

AMERICAN ELECTRIC POWER SYSTEM

(Pe r o r m e r l y American Gas and Electric System)

1. Pikeville, Kentucky—ENGINEERING SECTION HEAD
William W. Zoellers (Univ. Ky., BSEE '51) adjusts step-voltage regulator serving an important industrial customer.

2. New York City—PLANNING SYSTEM EXPANSION
James E. Bebeler (Purdue, MSEE '48), Frank W. Clover (Carnegie Tech, BSEE '47; Harvard, MA '51), Richard E. Disbrow (Lehigh, BSEE '52), plan the AEP System of the future with a network analyzer.

3. New York City—STAFF ENGINEERS
Richard H. Pechstein (RPI, BME '46) and John E. Dolan (Columbia, BSME '50) perform heat balance calculations on new steam cycle.

4. Wheeling, W. Va.—DISTRIBUTION ENGINEERING
Enea Antonucci (West Virginia, AB, BSFE '54) and Robert O. Meador (Tri-State, BSEE '49) supervise installation of underground distribution facilities.

5. New York City—NUCLEAR POWER ENGINEERS
John R. Stryuk (Clarkson, BME '51) and Robert S. Hunter (Penn State, BSME '50) discuss design of fuel element.

6. New York City—APPLYING DIGITAL COMPUTERS
Howard K. Amchlin (Penn State, BSEE, '46; IT, MSIEE '49) and Glenn Stagg (MIT, BSEE '48; NYU, MBA '56) selected by Eta Kappa Nu as one of three outstanding young engineers in the U. S. in 1958, solve a special problem faced by the AEP System.

7. Roanoke, Virginia—INDUSTRIAL POWER ENGINEER
Robey Jarrett (Virginia Polytechnic Institute, BSEE '51) consults with contractor on progress of motel to be heated and cooled electrically.

8. Canton, Ohio—SYSTEM OPERATION ENGINEER
Richard P. Blaes (Dayton, BEE, '51) helps to coordinate load scheduling and exchange of power with other electric utilities.

9. Twin Branch, Indiana—POWER PLANT MAINTENANCE SUPERVISOR
Herbert A. Bisninger (Michigan College of Mining and Technology, BSME '50) leads briefing session concerning turbine overhaul schedule.

10. East Liverpool, Ohio—DISTRICT MANAGER
William A. Black (MIT, SMEE '50) discusses operating problem with the supervisors on his staff.

11. New York City—RESULTS ANALYSIS
Engineering trainee Paul Butler (Purdue, BSME '58) discusses features of recording instrument with steam generation engineer Richard C. Kopelow (Michigan, BSME '51).

12. New Haven, West Virginia—RESULTS ENGINEER
William R. Johnston (Univ. of Cincinnati, BSME '51) analyzes circuit for electronic instruments at a major power plant.

13. Muncie, Indiana—DIVISION METER SUPERVISOR
Jack Stark (Purdue, BSEE '49) examines the demand chart on a metering device for an industrial customer.

14. New York City—HIGH VOLTAGE RESEARCH
Jack M. Miller (Milwaukee, BSEE '57) and Robert H. Scholman (MIT, MSIEE '56) discuss means for reducing radio influence on 345 kv transmission lines.

Page 38 THE ROSE TECHNIC
CAMPUS SURVEY
(Continued from page 17)
will live in the hearts of those who knew him.

The convocation was appropriately closed with a prayer by the Chaplain of the Institute, the Reverend Leroy Brown.

Blue Key Officers
On May 15, 1958, the local chapter of the Blue Key Fraternity held elections to select officers for the 1958-59 school year. Larry Grimes was elected president; Mick Adams, vice president; Bill Kuchar, secretary-treasurer; Carl Herakovich, corresponding secretary; and Joe Bronnert, alumni secretary.

Members of Blue Key are presently making plans for one of Rose's biggest Homecoming celebrations in honor of the Institute's 75th year of operation. They extend a special invitation to all alumni to return to Rose for the weekend of October 18th to help celebrate our Diamond Anniversary.

(Continued on page 40)

THE ENGINEER
He only drinks to calm himself, His steadiness to improve.
Last night he got so steady, He couldn't move.
* * * * *
Take Heed Engineers!
A little kissing now and then Makes husbands out of single men.
* * * * *
At the ball game, the young man sat intently watching the home team losing the game. He turned to the young lady accompanying him and remarked, "See that big substitute pitcher down there? I'm sure he will turn out to be our best man."

Greatly surprised, the young lady was quick to respond, "Why you dear, how wonderful! But isn't this rather sudden?"
* * * * *
The reason a lot of gals never get married is because they are biased. Their boy friends get tired of the "bias this and bias that" stuff.

Woodridge Motel

A Quality Court
and
Woodridge Restaurant

Superior Food in a Delightful Atmosphere

ONE MILE WEST OF
ROSE POLYTECHNIC INSTITUTE
ON U. S. 40

Phone C-1808 Terre Haute, Ind.
Freshmen Welcomed

On Sunday, September 8th, the freshmen and their parents were welcomed by the faculty and dormitory counselors. On Monday, September 9th, the freshmen were again welcomed, this time by the sophomores. Wearing of greencaps and garters was stressed. The alert sophomores, smarting from their humiliation the previous year, pounced immediately on several violators, and taking advantage of their ignorance, marched them, military-style, to and into the crystal clear water of the lake. Freshman retaliation was very slight and on Wednesday the sophomores struck again. After a meeting of freshmen to explain more Rose traditions, a few sophomore "decoys" proceeded to dunk greencaps as the frosh filed from the auditorium. Seeing their chance, the class of '62 gleefully carried the "decoys" as the frosh filed from the auditorium. At the time of this writing, all is quiet on the Rose front, with the sophomores seemingly holding the upper hand. But rumblings from within the freshmen class lead us to expect more action soon.

Constitution Changed

Last spring, the student body of Rose voted to accept a revised Constitution prepared by the Student Council. In addition to a few changes in policy, the organization of the Council has been changed to include the president and three other members of each class, all four elected by the particular class they represent.

Presently serving on the Council are the following: Seniors: Ken Hollingsworth, president, Larry Logue, Jim O'Donnell, and Larry Wilson. Juniors: Jim Onnen, president, Louis Roehm, Bart Gronberg, and Dan LaGatta. Sophomores: Bob Checkley, president, Jerry Heiniger, Jon Stiles, and Bill Carter. Representatives of the Freshman class will be chosen later this fall. Officers of the Student Council will be chosen by the Council itself.

Freshman Smoker

The annual Freshman Smoker was held in the cafeteria on September 9th. The Blue Key Fraternity sponsored the smoker. Larry Grimes, president of Blue Key, presided over the meeting, designed to acquaint the freshmen with the faculty and extra-curricular activities at Rose. Officers of the various clubs and organizations on campus were introduced and gave brief talks concerning their particular activity. Dean Herman A Moench introduced the members of the faculty. Bob Checkley, president of the sophomore class, explained a few Rose traditions that all freshmen should observe. Refreshments and informal mixing among students and faculty ended the Smoker. The class officers for the 1958-59 school year were elected by their classes toward the end of the preceding school year. Nominations requiring three signatures were accepted by the Registrar and elections were supervised by the previous year's officers.

Results are as follows: Senior Class: Ken Hollingsworth, president; Mike Munro, vice president; Carl Herakovich, secretary. Junior Class: Jim Onnen, president; Bob Shukai, vice president; Jim Phillips, secretary. Sophomore Class: Bob Checkley, president; Dave Lanning, vice president; Dave Trueb, secretary. The Freshman class will elect officers early this fall.
FRATERNITY NOTES
(Continued from page 30)
mander (Bro. Anderson) and Brother Crisp had the good fortune to be able to attend the meeting of “Grand Chapter.” Quite a lot of Fraternity business was set in order and, I think somewhere along the line, our two representatives managed to sandwich in a little business of their own?? What say you Bro’s???

That’s all the reporting to do right now, so until next time when you see the old Serpents sign hung out on that friendly page in the Technic, I’ll bid you—Bye.

Fred Ryker

Theta Xi

As another school year has come upon us the men of Theta Xi have returned to “Dear Old Rose” in fine spirits. All of the brothers are looking forward to a successful year both academically and fraternally.

The first week back to school saw the hard working brothers busily getting the lawn and house shipshape for the coming year. Some new improvements are under consideration for the house at 902 South Sixth and we are all hoping that they will prove successful.

Our ranks have been shortened somewhat due to graduation but TX still plans a well-rounded program of activities this year. Our social chairman Mel Matthews, though now a husband, still plans many exciting events for the fraternity calendar. A “back to school” stag is planned for the very near future and will be enjoyed I’m sure by all.

With the football season just around the corner the TX Tigers are polishing their fangs in hopes of winning the interfraternity football trophy for the third consecutive year. A victory this year would put the trophy on the mantle for good and you can bet that the boys will be in there doing their very best.

Of course the engineering brains of Theta Xi have been hard at work with plans for homecoming. The plans are top secret but the display this year promises to be the greatest thing since the steam engine. With this year being the seventy-fifth anniversary of our dear institution we are sure it will also be a first place year for Theta Xi.

It seems that a few of our brothers could find nothing better to do this summer than get married. Gene Blastic, Ray Gompf, Gary Leavitt, David Spoonamore, Bob Manning, Mel Matthews, and Gary Tate, have all fallen victim to the opposite sex. Brothers Cunningham and Ransford are also well on the way to matrimony. They managed to lose that shiny gold pin this summer.

Before closing I’d like to mention the tragic death of our brother, Harry Webber. Harry was fatally injured in a motorcycle accident this summer. The Kappa men expressed their sympathy to Harry’s parents by sending them an inscribed color portrait. I’m sure I express the thoughts of all TX men when I say that Harry will be missed very much.

Well that seems to be all the news for this issue. See you in the next Technic.

Fred Ryker

Williamson

Flower

Shop

“Flowers For All Occasions”

4517 Wabash Ave.

C-2222

October, 1958
THE NEW FRONTIER
(Continued from page 30)

Poudre Supply Canal, and North Poudre Supply Canal.

Facts of interest about the project include water supply and distribution facts. The Western Slope collection area of 438 square miles produces an average of 298,000 acre-feet of water annually, of which 257,700 acre-feet are surplus and available for diversion. This is used to supplement the 900,000 acre-feet produced annually by the Eastern Slope streams for irrigation of the 615,000 acres of project lands.

The Colorado-Big Thompson Project is very big and was very expensive to build, but the benefits derived from it are tremendous. It has stabilized the agricultural and industrial economy of northeastern Colorado. The project is particularly effective each year during late summer months of the irrigation season and has a tremendous impact throughout the season in drought years.

The sales of electrical energy in 1954 produced a revenue of $2,800,000. Indirect benefits from the project are evidenced by ever increasing new businesses, new capital improvements, and an increase in valuations serving as a tax base. The Colorado-Big Thompson Project has undoubtedly been very important, very beneficial to northeastern Colorado.

And the Colorado-Big Thompson Project is only one of many water diversion projects carried out by the U.S. Government. Other projects have been just as big, meant just as much to the area they serve. Northeastern Colorado is but one of several areas that have been given a new life by water diversion. The new frontier of irrigated land is growing, and it will continue to grow in the future. Civil engineering is opening a new frontier for America.


Evan's Flower & Gift Shop

- First in Quality
- Fairest in Price
- Fastest in Service

Flowers For All Occasions

13 South 13th St.
Terre Haute, Indiana

Experience is a great teacher but . . .

you can learn more from books cheaper and faster

Order your books through Rose Polytechnic Book Store

Cleaners STAR Launderers

11th and Lafayette

Phone L-6177

We Operate the Most Modern Dry Cleaning Plant In The City

Page 42
Freitag-Weinhardt
Inc.
917 Eagle St.
PHONE C-2394
PLUMBING -
HEATING
AIR CONDITIONING
ALLEN I. WEINHARDT
CHARLES J. KANTMANN

THE
PARKMORE
RESTAURANT
Where R.P.I.
Men Meet
A Good Place
For Grads
To Eat

Byrd Bros.
NEHI BOTTLING CO.

Royal Crown Cola
and
Nehi Flavors
1348 Sycamore St.
Terre Haute, Ind.
Phone C-3054

ADVERTISING INDEX

1. ALCOA ........................................ 31
4. Asphalt Institute ............................ 5
5. A. W. Faber ................................. 37
6. Blossom Shop ............................... 39
7. Copper and Brass Research .............. 32
8. Eagle Pencil Co. ............................. 26
9. Eastman Kodak .............................. Cover
10. E. I. DuPont ................................. 29
11. Evans Flower Shop ........................ 42
12. Freitag-Weinhardt ......................... 43
13. Garrett Corp. .............................. 25
14. General Electric ................................ Cover
15. General Motors ............................. 4
16. Hein's Flower Shop ......................... 40
17. Hunter-Gillum-Hunter ...................... 43
18. Indianapolis Briketerete .................. 39
19. International Nickel ....................... 6
20. Latta Motel .................................. 43
21. Nehi Bottling Co. .......................... 43
22. Parkmore Restaurant ...................... 43
23. Pepsi-Cola Bottling Co. ................... 40
24. Pratt & Whitney ............................ 22
25. Rose Book Store ............................ 42
26. Rose Polytechnic Institute .............. 7
27. Standard Oil of Indiana ................... 1
28. Star Cleaners ................................ 42
29. Taber's Motel ................................ 41
30. U. S. Steel Corp. .......................... Cover
31. Western Electric ............................ 21
32. Westinghouse Corp. ....................... 2
33. Williamson Flower Shop ................. 41
34. Woodridge Motel ........................... 39

October, 1958
If it's funny enough to tell, it's been told; if it hasn't been told it's too clean; and if it's dirty enough to interest an engineer, the editor gets kicked out of school.

It has been brought to the attention of the engineering office that a Miss Helen Hunt has found a slide rule. Any engineer who has lost his slide rule can go to Helen Hunt for it.

A Parson at the Fountainebleau Hotel gazed disapprovingly at his daughter's new bathing suit and remarked, "Shirley it's just big enough to prevent your being tanned where you ought to be.

I asked my girl if me she'd wed, She lifted up her lovely head, And in her sweetest manner said, "Go ask Father"

When I was but a little lad Upon my Mother's knee, She used to ask me, "Son of mine— What will you one day be?"

And I, with my slide rule in my hand— The toy I loved so dear— Would answer, "Mamma, you will know I'll be an engineer!"

While other little boys my age Were reading fairy tales, I'd bug my little eyes out Over books of logs and scales. The formulae they stuffed me Was not sweet milk and meal— I'd eat quotation X times Y— How good they make me feel!

And so it was that pi to me Was nothing that I ate. I knew it equaled three one fourth The calculus and algebra Became my bone and point. What difference did it really make If my head came to a point? Then as it is in every life A kindred soul I spied— I wooed her with exponents and with fractions she replied. Her eyes were complex variables, Her figure hyperbolic, Her smile was quite symbolic Our wedding was a joining of two mathematical wizards. We knew all calculations From Alpha to the izzards. Yet with all this wealth of knowledge no matter how we try, The operations we do best is just to multiply!

Girls are like newspapers. They all have forms, they always have the last word, back numbers are not in demand, they have great influence, you can't believe everything they say, they're thinner than they used to be, they get along by advertising, and every man should have one of his own and not try to borrow his neighbors'.

We wonder if you've seen the bulletin put out by the Engineering schools that contains the following passage:

"The five-year course in Engineering can be easily completed in seven years if the student faithfully attends night school and goes to summer school for three summers.

Junior: Daddy, what's a sweater girl?
Daddy: Why . . . er aah . . . a sweater girl is a girl who works in a sweater factory. (After a moment's pause): Where in the world did you get that question?
Junior: Where in the world did you get that answer?

"Do you neck?"
"That's my business."
"Ah, at last . . . a professional."

How did mothers ever learn all the things they warn their daughters not to do?
"Tree Rubber" made in U.S.A. for tires of tomorrow

Photography and x-rays pointed the way for Goodrich-Gulf Chemicals Inc. to achieve a synthetic that matches natural rubber.

Heavy-duty truck and airplane tires always had to have tree rubber to assure acceptable performance. Usual man-made rubber didn’t quite fill the bill. Its molecules didn’t hang together like natural rubber.

But now Goodrich-Gulf scientists, using x-ray diffraction photographs to check molecular structure, have produced Ameripol SN, a man-made rubber with the same physical properties as crude rubber even to tack and stickiness. It’s an achievement that can mean a source of supply for the nation’s new-rubber needs.

Playing a part in research like this is only one of the many ways photography is working for business and industry today. In addition, it also delves into problems of product design, production, and quality control. It trains employees, dealers and salesmen—does a selling job right to the consumer.

Photography is saving time and cutting costs for all kinds of businesses, large and small alike. It works for you in whatever occupation you choose.

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

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.
Interview with General Electric's
Earl G. Abbott
Manager—Sales Training

Advancement in a Large Company: How it Works

Where do you find better advancement opportunities—in a large company or a small one? To help you, the college student, resolve that problem, Mr. Abbott answers the following questions concerning advancement opportunities in engineering, manufacturing and technical marketing at General Electric.

Q. In a large Company such as General Electric, how can you assure that every man deserving of recognition will get it? Don't some capable people become lost?
A. No, they don't. And it's because of the way G.E. has been organized. By decentralizing into more than a hundred smaller operating departments, we've been able to pinpoint both authority and responsibility. Our products are engineered, manufactured and marketed by many departments comparable to small companies. Since each is completely responsible for its success and profitability, each individual within the department has a defined share of that responsibility. Therefore, outstanding performance is readily recognized.

Q. If that's the case, are opportunities for advancement limited to openings within the department?
A. Not at all. That's one of the advantages of our decentralized organization. It creates small operations that individuals can "get their arms around", and still reserves and enhances the inherent advantages of a large company. Widely diverse opportunities and promotions are available on a Company-wide basis.

Q. But how does a department find the best man, Company-wide?
A. We've developed personnel registers to assure that the best qualified men for the job are not overlooked. The registers contain complete appraisals of professional employees. They enable a manager to make a thorough and objective search of the entire General Electric Company and come up with the man best qualified for the job.

Q. How do advancement opportunities for technical graduates stack-up with those of other graduates?
A. Very well. General Electric is recognized as a Company with outstanding technical skills and facilities. One out of every thirteen employees is a scientist or engineer. And approximately 50 per cent of our Department General Managers have technical backgrounds.

Q. How about speed of advancement? Is G.E. a "young man's Company"?
A. Definitely. A majority of all supervisors, managers and outstanding individual contributors working in the engineering function are below the age of forty. We believe that a job should be one for which you are qualified, but above all it should be one that challenges your ability. As you master one job we feel that consideration should be given to moving you to a position of greater responsibility.

Q. Some men want to remain in a specialized technical job rather than go into managerial work. How does this affect their advancement?
A. At G.E. there are many paths which lead to higher positions of recognition and prestige. Every man is essentially free to select the course which best fits both his abilities and interests. Furthermore, he may modify that course if his interests change as his career progresses. Along any of these paths he may advance within the Company to very high levels of recognition and salary.

Q. What aids to advancement does General Electric provide?
A. We believe that it's just sound business policy to provide a stimulating climate for personal development. As the individual develops, through his own efforts, the Company benefits from his contributions. General Electric has done much to provide the right kind of opportunity for its employees. Outstanding college graduates are given graduate study aid through the G-E Honors Program and Tuition Refund Program. Technical graduates entering the Engineering, Manufacturing, or Technical Marketing Programs start with on-the-job training and related study as preparation for more responsible positions. Throughout their G-E careers they receive frequent appraisals as a guide for self development. Company-conducted courses are offered again at all levels of the organization. These help professionals gain the increasingly higher levels of education demanded by the complexities of modern business. Our goal is to see every man advance to the full limits of his capabilities.

If you have other questions or want information on our programs for technical graduates, write to E. G. Abbott, Section 989-9, General Electric Co., Schenectady 5, N. Y.

*LOOK FOR other interviews discussing: • Qualities We Look For in Young Engineers • Personal Development • Salary.