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Rose Technic Staff

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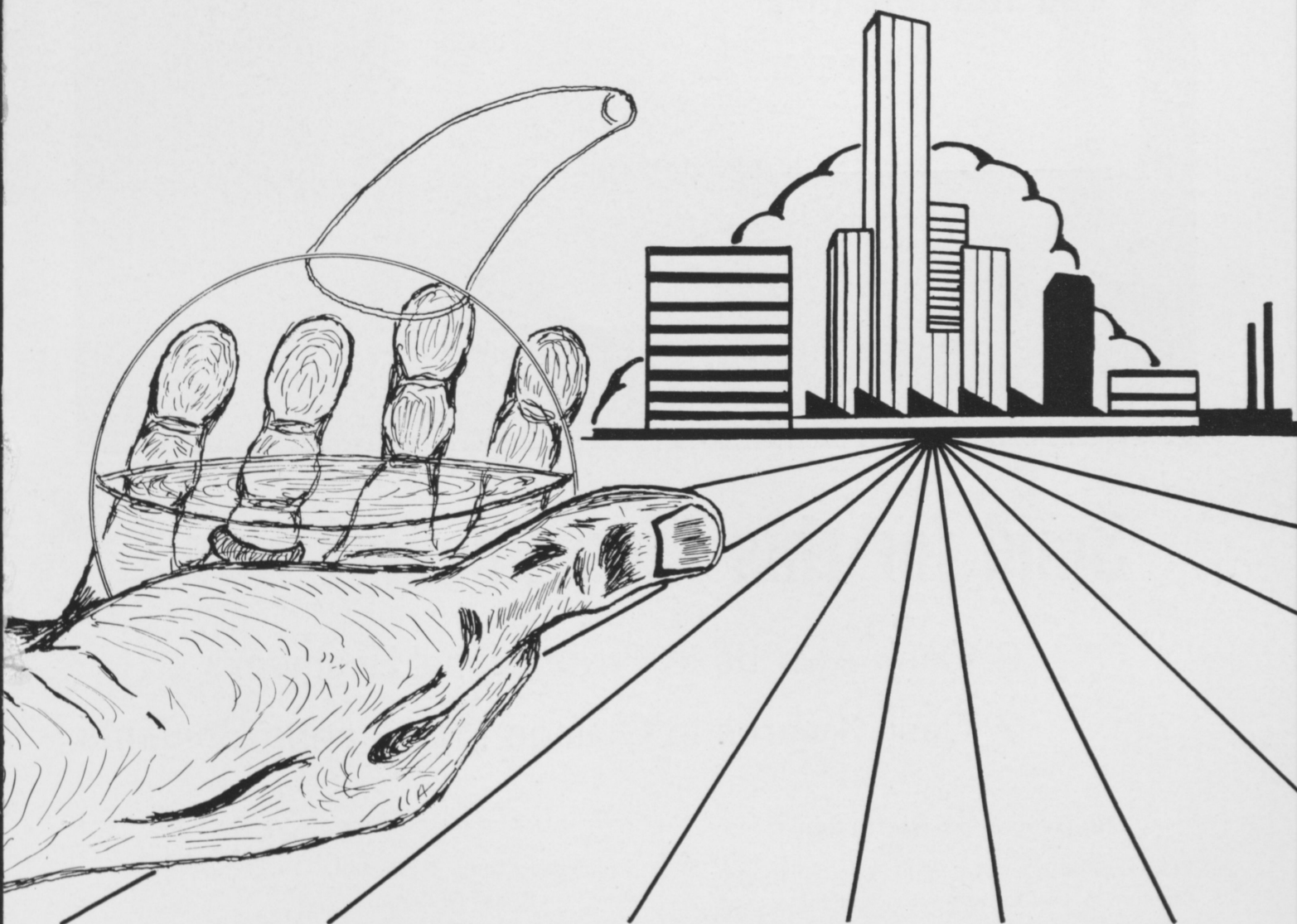
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Rose Technic

February, 1959



In This Issue

RADIO ASTRONOMY

WHERE DOES THE MONEY GO?

RUNNING SCARED

**You still have time
to enter**

RULES

FOR

\$44,000

STEEL HIGHWAY BRIDGE

DESIGN COMPETITION

American Bridge
Division of



United States Steel

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This competition involves the design of an overpass structure in *steel* to carry a two-lane highway at right angles over a four-lane interstate highway on level terrain in accordance with standards for today's modern highways. For complete information, just fill in and mail the coupon and *get started with your design without delay*. Deadline for entries is May 31, 1959.

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American Bridge Division,
525 William Penn Place, Pittsburgh 30, Pennsylvania**

*Please send me a copy of your \$44,000 Steel Highway Bridge
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City **State**

QUESTIONS ROSE POLY STUDENTS ASK MOST OFTEN

about today's opportunities at Alcoa

1. What are the opportunities for a graduate with my degree?

Alcoa has openings for graduates with most types of degrees each year. Opportunities exist in engineering, production, research, development and sales for Mechanical, Metallurgical, Electrical, Industrial, Chemical and Civil Engineering graduates and for Chemists for research.

2. Where will I be located if I am employed by Alcoa?

Assignments for new Engineering and Production employees are at one of 30 Alcoa operating locations. New Sales Engineering and Sales Administration employees, after their six-month training program, go to one of Alcoa's 72 sales offices. Sales Development and Process Development employees work either at New Kensington, Pa., or Cleveland, Ohio. Research employees are assigned to one of Alcoa's five research locations.

3. What type of training program does Alcoa offer?

The training program varies with the type of job. Some are formal programs where concentrated attention is given groups of new men. Other training for individuals is more specialized.

4. What is the starting salary at Alcoa?

Alcoa pay is based on initial allowance for a basic four-year degree. Additional credit is given for ad-

vanced educational training, length of military service and amount and type of previous work experience. Future salary progress depends entirely on individual merit.

5. If I am hired, will Alcoa pay moving expenses?

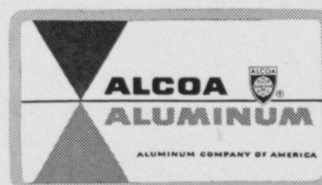
Yes. Alcoa will pay transportation and moving expenses for you and your family to your first and all subsequent assignments.

6. How does Alcoa insure personal recognition for its people?

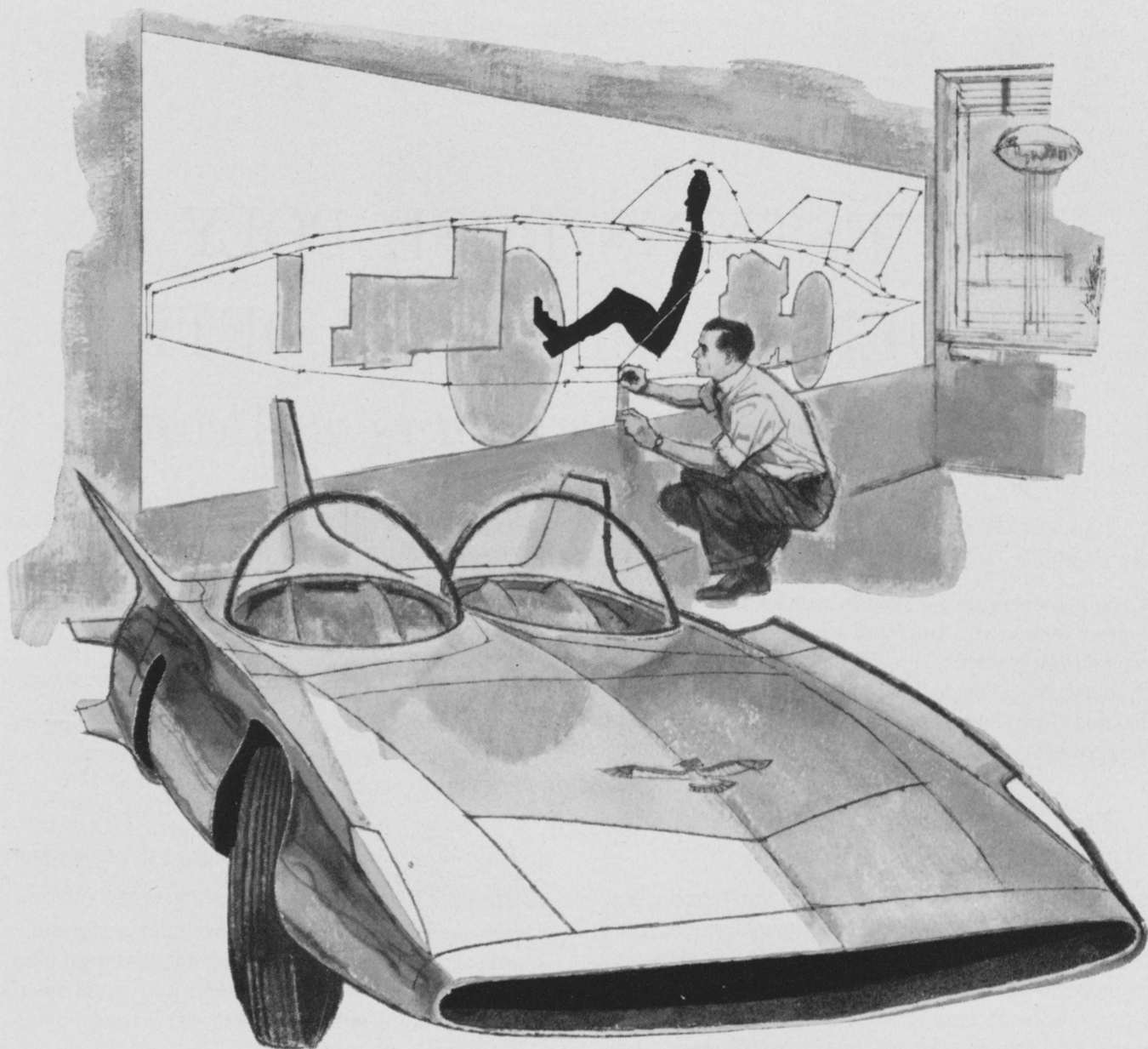
Alcoa's personnel policies call for regular performance appraisals, individual opportunity for advanced management training, confidential and individual salary consideration and promotion from within the company.

7. How do I apply for a position with Alcoa?

Contact your placement officer to arrange an interview. If you would like more details immediately, write Manager, College Recruitment, 809 Alcoa Building, Pittsburgh 19, Pa., for the newly revised booklet, *A Career For You With Alcoa*.



Your Guide to the Best
in Aluminum Value



*At General Motors
there's room
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imagination!*

GM positions now available in these fields for men holding Bachelors', Masters' and Doctors' degrees: Mechanical Engineering • Electrical Engineering • Industrial Engineering • Metallurgical Engineering • Aeronautical Engineering • Ceramic Engineering • Mathematics • Industrial Design • Physics • Chemistry • Engineering Mechanics.

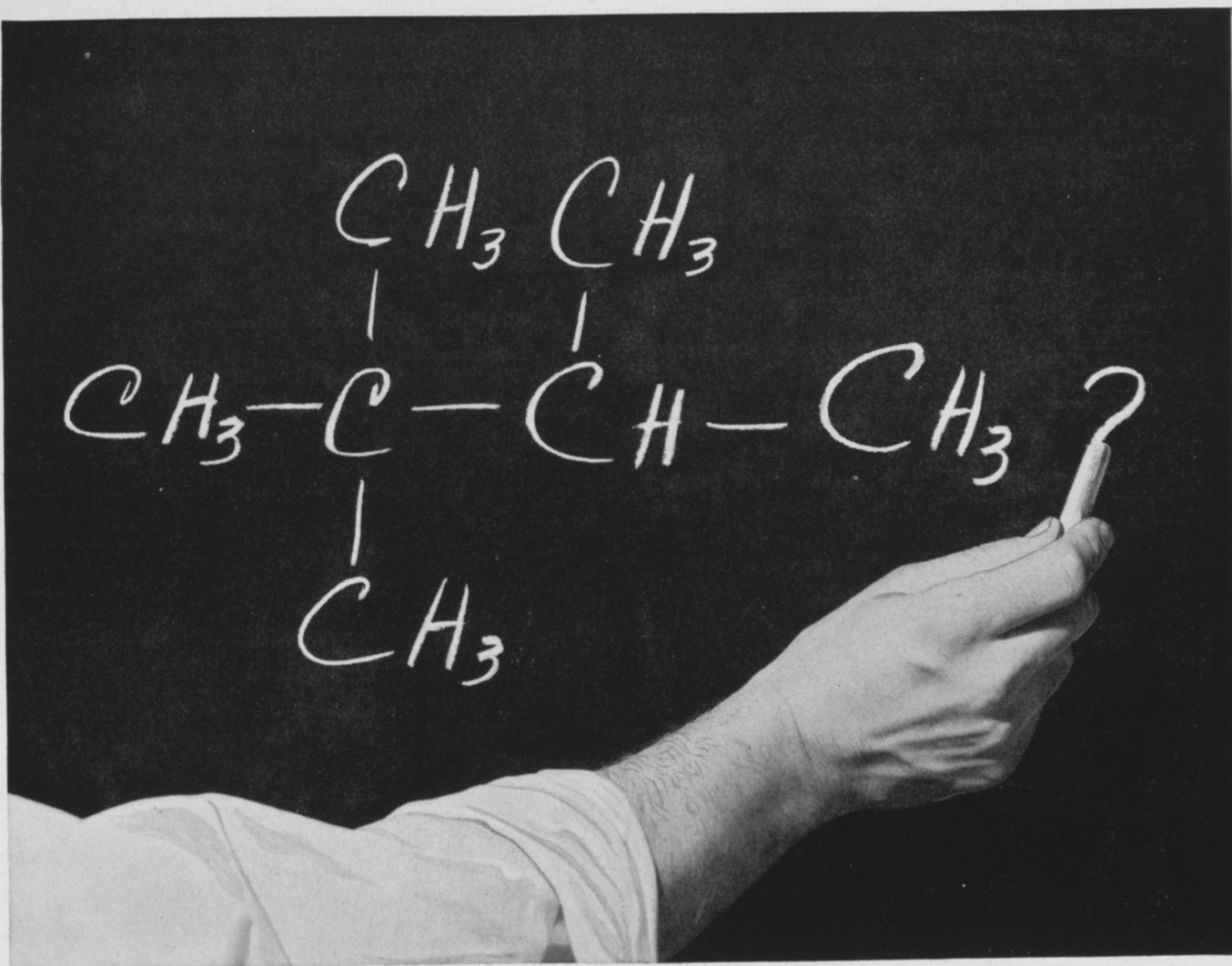
A single control starts, stops, and steers the Firebird III—or this GM "laboratory on wheels" can be safely guided by electronic impulses sent from a cable buried under the road!

Fabulous steps into the future, such as this, can be made only by men with fabulous imaginations. A lot of such men work for General Motors and its divisions. There's room for a lot more—maybe you.

In addition to research in the automotive and appliance fields, General Motors and its divisions are concerned with solar energy, astronautics, astrodynamics, electronics, and many fields of space engineering. If these areas of scientific study challenge your imagination, perhaps GM has a place for you at one of its plants in 71 cities.

Here is a real opportunity to put your imagination to work on everything from tiny transistors to dynamic diesels. Write General Motors, Personnel Staff, Detroit 2, Michigan.

GENERAL MOTORS PERSONNEL STAFF
DETROIT 2, MICH.



Triptane, whose formula is shown above, represents one of the most important challenges in petroleum research. Although oil companies have been working

with this valuable gasoline anti-knock component for 15 years, no method for low-cost commercial production has yet been developed.

We don't have all the answers...yet!

We already know quite a bit about triptane, whose formula is shown in the picture. It is a branched heptane. Scientists at Standard Oil's laboratories can tell you that its octane number is 113. It is one of the best gasoline ingredients ever discovered.

As far back as 15 years ago, triptane could be produced in tank truck quantities. But no one has yet developed a large volume commercial method of making this valuable material.

Triptane represents but one of the creative research challenges that exist in the oil indus-

try. A commercial way to make cyclopentane, another anti-knock material, ranks high on the list of unsolved problems. The same is true of certain hydrogenated polymethyl naphthalenes; their high energy content and low pour-point make them ideal for jet fuel.

At Standard Oil, young scientists and engineers have the opportunity to help solve important problems such as these. Here they can use their skills and knowledge to build satisfying, lifetime careers.

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910 SOUTH MICHIGAN AVENUE, CHICAGO 80, ILLINOIS



THE SIGN OF PROGRESS...
THROUGH RESEARCH

Rose Technic

VOLUME LXX, NO. 5

FEBRUARY, 1959

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Contents

Editorial	9
Running Scared	10
Where Does The Money Go?	12
Radio Astronomy	14
Military Ball	18
Overheard in E.E. Lab.	38

* * * * *

Fraternity Notes	16
Campus Survey	20
Research and Development	24
Alumni News	26
Library Notes	30
Locker Rumors	32
Brain Ticklers	36

* * * * *

Advertising Index	42
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Cover Note

This month's cover, "The Gift To The World," was drawn for The TECHNIC by Francis Hirt, Sophomore Math Major.

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Why diversification makes a better all-around man

DIVERSIFICATION of effort makes for versatility—and versatility pays off in business as well as on the athletic field. We've found that to be especially true here at Koppers.

Koppers is a widely diversified company—actively engaged in the research and production of a wide range of related and seemingly unrelated products, such as remarkable new plastics, jet-engine sound control, wood preservatives, steel mill processes, dyestuffs, electrostatic precipitators, coal tar chemicals, anti-oxidants and innumerable others.

Because we are diversified, our work is interesting. Through a system of lateral movement, our engineers and management personnel are given the opportunity to learn many of the diverse operations at Koppers. The result? Versatility.

While you are moving laterally at Koppers, you are also moving *up*. Your responsibilities are increased. Your ability is evaluated and re-evaluated. And you are compensated accordingly.

You don't have to be with Koppers for 20 years before you

get somewhere. If you have ability, ideas, spark—you'll move ahead, regardless of seniority or tenure.

At Koppers, you'll stand on your own two feet. You'll get responsibility, but you'll also have free rein to do the job the way *you* think it should be done. No one will get in your way.

Koppers is a well-established company—a leader in many fields. Yet, it's a forward-looking company, a young man's company. Perhaps, *your* company.

Why not find out? Write to the Manager of Manpower Planning, Koppers Company, Inc., Pittsburgh 19, Pennsylvania. Or, see your College Placement Director and arrange an appointment with a Koppers representative for the next recruiting visit.

KOPPERS



"If creative engineering is your career be sure you choose an engineer-minded company"

says R. T. Cox, Vice-President of Research & Development, Collins Radio Company



"Collins Radio Company is a dynamic, fast-growing company with an excellent reputation built on a solid foundation of engineering talent. Sales have increased 10-fold in the last 10 years. Employment of research and development personnel has more than kept pace. Collins will continue to grow; you can grow with Collins.

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office or write*

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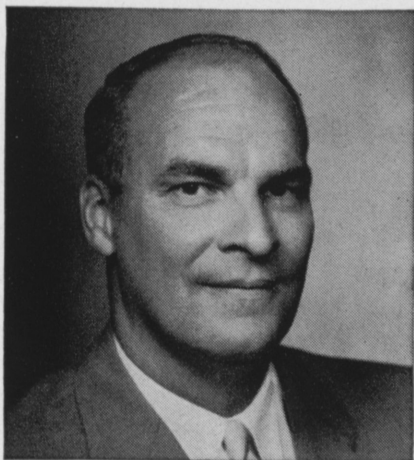
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Radio Company
1930 Hi-Line Drive
Dallas,
Texas

YOUR INTERESTS, SPECIAL ABILITIES ARE IMPORTANT WHEN DU PONT MAKES YOUR FIRST JOB ASSIGNMENT

BENEFIT PROGRAM MEANS ADDED INCOME

by A. F. Hartford, Jr.
Du Pont personnel representative



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.

PERSONALIZED TRAINING RELATES TO POLICY OF PROMOTION FROM WITHIN

Where do your interests lie? What courses have you taken? What are your special abilities? Du Pont tries to match these factors with available openings to determine your first assignment within the Company.

Once the assignment is made, the Company helps you apply your knowledge to a problem right away. You learn by doing and by consulting with your supervisor and others working on various phases of the same project.

Your performance on the job is evaluated periodically to assist you in knowing where you stand in the eyes of your management. And, as you might guess, Du Pont's personalized training is closely related to its promotion policy. Practically all promotional opportunities are filled by advancement from within the Company.

It is especially important for the college student to know that management authority at Du Pont is decentralized through many departments into small groups—small enough so that the new man's capabilities can be recognized. This type of organization, plus the Company's steady growth, produces many opportunities.

SEND FOR INFORMATION BOOKLET

Booklets about the kinds of technical jobs at Du Pont are yours for the asking. Subjects include: mechanical, civil, metallurgical, chemical, electrical, instrumentation and industrial engineering; technical sales, business administration, research and development. For a copy of one of these booklets write to Du Pont, 12421 Nemours Building, Wilmington 98, Delaware.

MECHANICAL ENGINEERING MOVIE AVAILABLE FOR A.S.M.E. MEETINGS

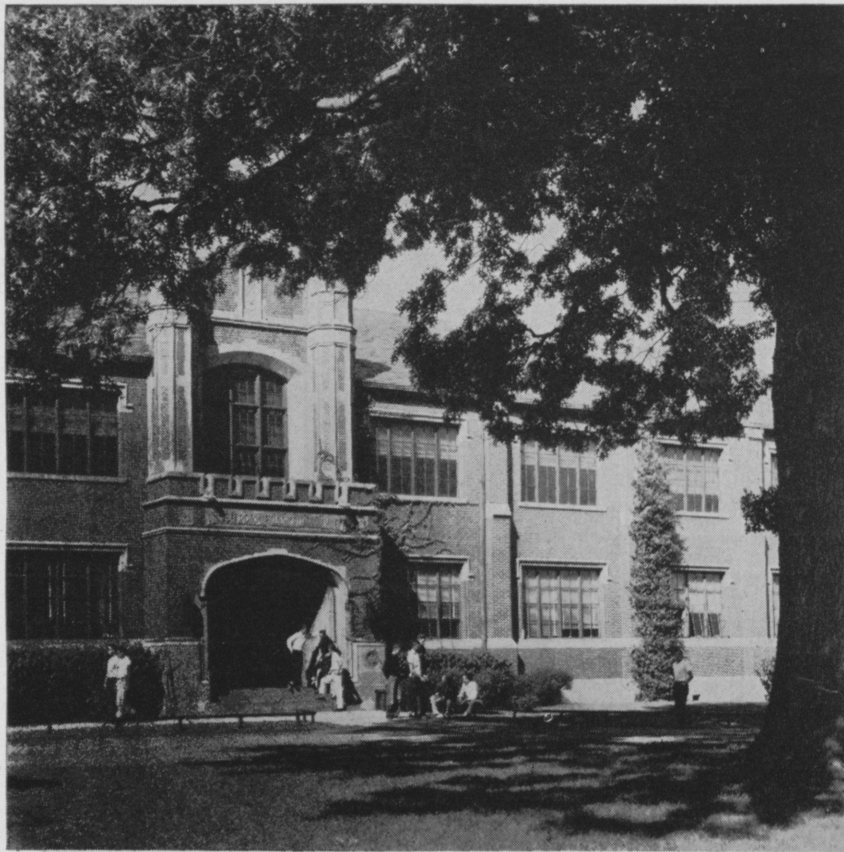
Just what does a mechanical engineer do at Du Pont? Whether your chosen field is research, development, design, production supervision or plant engineering, you'll find many of the answers to this question in the informative film, *Mechanical Engineering at Du Pont*.

From start to finish, this film has been prepared with the young engineer in mind. Its express purpose is to show him where he fits into the picture—what kind of assignments he will be called upon to handle in the chemical industry.

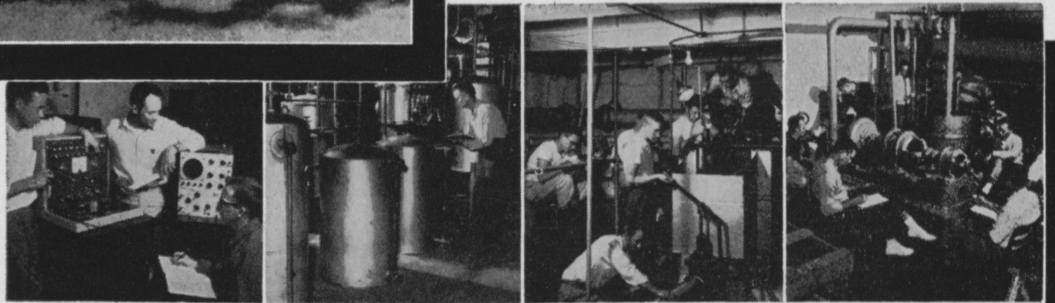
This is a realistic on-the-job film, without frills and falderal. No professional actors appear in it. All photography was done right in Du Pont plants and laboratories, and everyone you will see in it is a working Du Pont engineer.

If you would like to learn in considerable detail what mechanical engineers do in the chemical industry, arrange to see this Du Pont film. *Mechanical Engineering at Du Pont* is available at no cost for A.S.M.E. chapter meetings, fraternity house and dormitory showings. Write to Room 12421 Nemours Building, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.





ROSE



ROSE POLYTECHNIC INSTITUTE

TERRE HAUTE, INDIANA

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

Office
OF ADMISSIONS

ROSE POLYTECHNIC
INSTITUTE
TERRE HAUTE, INDIANA

*The next freshman class will be admitted
September 14, 1959*

Activities for Engineers

In today's highly specialized world, industry is finding that tomorrow's leader is today's engineer. More and more, top men in research and development are stepping into executive positions. Engineering students must now realize that their technical education must not only be an expedient to a good job upon graduation, but must also prepare them to succeed others in positions of management.

Extra-curricular activities, both school and community, provide excellent opportunities for management experience. Take the *TECHNIC*, for example. The advertising staff provides opportunities for meeting community business men and learning good business practices. The feature staff reports on items of interest to Rose men, realizing the various types of personalities to which these articles must appeal. The contributing staff presents technical and non-technical articles which interest both student and graduate engineers, thereby presenting their views while gaining vast knowledge of new developments. The editorial staff maintains the high standards of the magazine by releasing well-written copy coupled with an attractive layout. All staff members realize the importance of operating on a pre-set time schedule and assume the responsibility of getting their work done on time.

Other valuable experience can be gained serving any of the campus organizations at Rose. Planning Glee Club tours and rifle matches requires much time and deliberation. Many hours are spent on the *MODULUS* in order to present a yearbook which will be both enjoyable and valuable as a reference for memories of Rose. The Radio Club must budget its time and money so that the equipment is in top working order.

It is never too early to get interested in extra-curricular activities. Any senior can evidence the consideration given to activities by company interviewers. Rose has a wide variety of student organizations—at least one in which every student can become interested. Don't wait for on-the-job management training!

R.L.S.

RUNNING

Editor's Note:

Running Scared was presented as a paper at Student's Night of the Pittsburgh Section, American Institute of Chemical Engineers by Dr. Everett P. Partridge, Director of Hall Laboratories Division of Hagan Chemicals and Controls, Inc. All engineering students take note.

As you go about prospecting for a job, many interviewers will inquire, "What are you?" What they mean, of course, is, "Have you completed certain prescribed courses in a formal curriculum which will lead people to think of you as a chemical engineer—or a mechanical or an electrical engineer or a chemist or a nuclear physicist?"

A much more significant question is, "What are you trying to become?" This is important, because all your life you will keep on becoming.

In doing this, you of the present generation will have to struggle against a particularly serious handicap. I don't mean a recession in business, for the economists' graphs for the future all zoom upward. By 1965 we shall have 25 million more people, \$100 million more gross national product, 115 million more kilowatts than we had in 1955.

Your *real* income will be slightly more than twice mine when I got out of college in 1925. You can expect your wife to work, too, so that your combined income will allow you to have two cars, even if no babies.

You need take no thought for the future, for you will be protected by:

1. medical, surgical and hospitalization insurance

2. unemployment insurance
3. severance pay
4. profit-sharing
5. pension
6. Social Security

You have it made. Why worry about anything?

This is a truly serious handicap. I think you go farther and have more fun if you run scared. By running scared I don't mean a state of panic. I do mean a state of mind which keeps saying to others of your own performance, "I should have thought of that," instead of "Well, you didn't tell me to."

If you do accept responsibility, inevitably you will feel the weight of it on your mind. You will worry about making the right decision, you will wonder afterwards if you did. You will feel uncomfortable.

Nobody likes to be uncomfortable. So the majority of men, including, unfortunately, some who call themselves engineers, seek security rather than responsibility. Their ideal job is one where everything that goes well is obviously a result of their good work, but everything that goes wrong is the fault of someone else—an incompetent boss or a stupid assistant.

Perhaps you have seen the early stages of this mental disease already in some classmate or even—perish the thought—in yourself. Whose responsibility was it that you didn't get much out of that course in English or differential equations or

heat transfer? Was it actually the fault of that lousy instructor . . . or of the classmate who wouldn't lend you his notebook the night before the exam? Or could it just possibly have been your own shying away from the responsibility of disciplining your own mind to work at the problem day after day?

When I was a student chemical engineer at Syracuse University, one of the courses required in the senior year was economics. It was taught by a professor from the College of Business Administration who came over to the College of Applied Science on Monday, Wednesday, and Friday at 10 A.M. for an hour that he must have dreaded. As engineers we were proud of our carefully nurtured cult of uncouthness. We also looked down on Business Administration because that was where all the boys who flunked out of engineering went. So we had the usual unthinking undergraduate fun with this utterly humorless professor of economics.

One item was the fictitious student we registered under a name I wish I could remember. Anyway, every time the solemn professor called the roll, there was laughter. After some five weeks during which we used all the usual ruses to report our imaginary classmate present—in the infirmary with sleeping sickness, or on his honeymoon—the professor realized that he had been taken. He stormed down to the Dean, shouted that he had never

SCARED

been so insulted in his life, and refused ever to teach that course in economics again.

We barely cared. What did economics have to do with engineering, anyway? We rather congratulated ourselves on having eliminated a dusty nuisance from our solid 8 A.M. to 5 P.M. schedule. I suspect, however, that my classmates have had to study economics quite a bit over the thirty years since.

I have a responsibility right here that I want to fulfill. If I fail, I could say, "Well, after all, what can you expect of young folks today? They have been spoiled by lack of discipline at home and in school. They just don't give a damn." What I actually should say to myself would be something like this. "Partridge, why didn't you get across to those students? Perhaps you weren't using their language. Perhaps you couldn't get inside their minds." That attitude might well be considered by some instructors who take their own responsibilities too lightly.

Because I feared I might not be tuned to the proper wave length for reception by you, I asked the last three recruits to our training course for field engineering services to sit down with me one afternoon some weeks ago. They suggested several little messages I might transmit. They say that out on the job:

1. You can't just cut classes when you feel like it.
2. You can't depend on your roommate to carry you through

some problem on which you are stuck.

3. Everything isn't in the books.
4. Don't expect things to happen overnight.
5. A training program isn't just a necessary evil to be gotten over as quickly and painlessly as possible.
6. You don't have to compensate for your inferiority complex by telling the boss the first week what to do and how to do it.
7. The shortage of engineers doesn't guarantee a good, continuing job with a future.
8. You have to assume responsibility.

How much can be expected of an engineer is illustrated by the experience of a man, now retired, who worked for many years for one of the large steel mills in the Pittsburgh area. As a young engineer in the utilities department, he was made responsible for all plant water. Full of vim, he checked the entire complicated distribution system, discovering, to his horror, that if one pump taking water from the river went out of service, the entire plant operation must inevitably be shut down. He convinced his boss and his boss's boss and so on all up the line to the president of the company that a second big pump should be purchased. But the president took a long look at the cost and said, "No." Not many months later the critical pump failed. The mill shut down.

The young engineer was promptly called to the president to explain why the water supply had failed. As tactfully as he could, he pointed out that he had warned against the precariously dependence on one pump, had even argued with the president himself for the purchase of a spare, and could therefore scarcely be blamed for the catastrophe. "Yes," roared the president, "but if we needed that extra pump, it was your job to convince me!"

When I stated my thesis that you go farther and have more fun if you run scared than if you feel secure, I meant both points. Let's consider why you go farther.

Here is an equation attributed to Dan McQuaid, who calls himself the cowboy engineer:

$$V = A - S$$

In words this reads: "The value of any position is equal to the ability of the individual to produce, minus supervision."

Strangely enough, industry is always looking for men to whom it can pay more money. Such men must have a value for $A - S$ that causes them to stand out from their fellows. Sometimes an individual who does not have exceptional ability to produce goes ahead on an inherently more able man simply because the average fellow is a self-starter who runs scared, while the more able fellow requires so much supervision that he is actually less valuable.

(Continued on Page 31)

Where Does The

Did you ever stop to think how much it costs you to attend Rose for one school year? If you have, you probably answered yourself by saying, "Too much." There always seems to be a shortage of that green stuff while you are in school, and an even greater shortage exists when a dance, your girl's birthday, or Christmas comes up. But you aren't alone in this state of "no-money-itis."

The fact of the matter is that nearly every college or university student like yourself or myself has financial problems at one time or another (or always). And, these problems are no more than to be expected. Certainly, going to college requires a great amount of money, and wherever large amounts of money are concerned, financial problems exist.

But why should we concern ourselves with this subject? Whenever we are a little short of cash, all we have to do is to write a check. And, whenever our account gets low, we can call home and tell Dad to put some more in the bank. Of course, Dad will probably raise the roof and ask, "Where is the money going?" And that is a very good question. Maybe this article will answer that question put so emphatically by our parents, and it may answer the same question for us now and again when we are married and have our own children attending colleges and universities.

Well, where does all this money

go? In considering the total cost to attend Rose, there are several major factors that constitute this total cost. They are (1) tuition and fees; (2) room and board; (3) books and supplies; (4) car expenses; (5) and miscellaneous expenses. Each of these factors contribute, some in varying degrees, to the total cost. The major influence for any variance is that of the student's living facilities. Therefore, let us categorize the student in this manner and find the sum of these factors in each case. The values for the various items presented in this article are average values and were obtained by the author by questioning approximately 40% of the student body. They are considered to be reasonable and reliable since they were obtained from a representative number of students.

Since there are more students living in a dormitory, than in any other type of dwelling, we shall determine this total cost first. Of course, the first factor, that of tuition and fees, is the amount of \$625 for one school year. Each student, regardless of his particular housing, has this initial expense. Secondly, room and board is certainly a big factor. The dormitories offer accommodation for one, two, or four students in a room, at varying semester rates for room and board, from \$215 to \$290. The average cost for this factor is \$250 per semester or \$500 per school year. It is the second largest factor composing this total

cost.

The next factor that we will consider is the cost of the books and supplies over a period of a school year. In the freshman year, this factor is quite high due to the initial investment for a slide rule and some drawing equipment. The cost for the first semester's books, slide rule, and drawing equipment may run as high as \$100. In succeeding semesters, this cost for books and supplies fortunately decreases to approximately \$30-\$40 per semester. Throughout the year, however, certain items have to be purchased, and they add further to the total amount of this factor. Looseleaf paper, crossrule notebooks, graph paper, ink, pencils, pens, rulers, and other such incidentals are some of these certain items. Taking an average of these semester expenses for books and supplies, a cost of approximately \$120 per school year was found to be the average.

The fourth factor is car expenses. Naturally, this does not apply to each of the dorm residents (or to every other Rose student), but it is certainly a major factor to consider where it is applicable. The values presented in this article represent the normal operational expenses of gasoline, oil and lubrication. They do not include the expenses of major repair work, insurance, licenses, or traffic tickets. It was found that a dorm resident spends approximately \$4.50 per week or \$170 per school year on a car. Since the dorm stu-

Money Go?

By Bob Schukai, jr., e.e.

dent does the least driving during the day (living on campus), he must be doing the most driving during the night, because his car expenses are comparable to those of students living in town who have to drive to and from school each day.

The fifth and final factor to be considered is miscellaneous expenses. This item includes such expenses as dates, haircuts, lunches, snacks, dances, and other luxuries and necessities. Perhaps dates and lunches contribute the most to this factor. On a date, it cost about \$3.00 to go to a movie and have a snack afterwards. Dances will usually cost more. So, it is evident that social life demands a fair amount of money per week. Then, a dorm resident must buy eight of his meals a week—two on Saturday and one the other days of the week. The amount spent for lunches does vary, but it certainly does contribute largely to the total of this element. Investigation showed that a dorm resident spends approximately \$7.50 per week or \$270 per school year on these miscellaneous expenses.

Now, let us total these elements to find a sum total cost for a school year.

Tuition & Fees	\$ 625
Room & Board	500
Books & Supplies	120
Car Expenses	170
Miscellaneous	270
TOTALS	
With Car	\$1685

Without Car \$1515

Since tuition and fees will be \$850 next year, this will increase the total cost \$225 to \$1910 or \$1740, assuming the other factors will remain the same.

If you happen to be a student who lives in a fraternity house, you can expect your expenses to be a little higher than those of a dorm resident. Naturally, your total cost is composed of the same five factors present in the above case, however, several of them vary in magnitude. The \$625 for tuition and fees is present. Room and board runs slightly higher than at the dormitory, and it was found to be an average cost of \$560 for a school year.

The next factor also is one that is the same, regardless of housing, and it is that of books and supplies. Again, the average cost of \$120 per school year adds towards the total. Then, there is the cost to operate a car. It may be surprising to find that you spend less to operate a car if you live in a fraternity house than if you would live anywhere else. Perhaps this is due to car pools which may be organized within the house. And, since you are already in town, it is not as far to drive to State or to St. Mary of the Woods or to your girl's house as it would be from the dorm. The investigation produced a figure of \$4.00 per week or \$155 per school year spent on a car. The final feature is that of miscellaneous expenses, and again, you

spend less on the average than a dorm resident for this item. You can expect to spend \$7.00 a week or \$255 during a school year on the same things, as mentioned above, that constitute these miscellaneous expenses.

Summing these figures, we arrive with the total cost for a resident of a fraternity house.

Tuition & Fees	\$ 625
Room & Board	560
Books & Supplies	120
Car Expenses	155
Miscellaneous	255

TOTALS

With Car	\$1715
Without Car	\$1560

For next year with the new tuition raise, our new totals will be:

With Car	\$1940
Without Car	\$1785

Certainly, the student who lives in a private home or apartment will have the greatest financial responsibilities. The costs of tuition and fees, and books and supplies are the same as before. Room and board, however, is higher than in any other case, and a figure of \$710 per school year was found to be the average. Operational expenses for a car run high also. The investigation showed that \$5.25 per week or \$195 per school year was the average spent. Miscellaneous expenses require the same amount of money in this case as in the case of the fraternity house.

(Continued on Page 35)

RADIO

One of the most fascinating and mysterious subjects available to man is the study of the universe outside of our own planet. This study involves figures and distances almost incomprehensible to the human mind. Distances are no longer measured in miles as they are here on earth, but they are measured in light years. A light year is the distance light travels in one year. This amounts to approximately six million million miles.

Up until recently, all exploration of the universe had to be done through the use of optical devices. Naturally, this placed many severe limitations on when the heavens could be studied. For example, the Big Schmidt telescope is being used to make a map of the universe for as far as it can see. It does this by taking pictures of what it sees. However, it cannot be used to take these photographs when the sky is overcast, or on a moonlit night. It cannot be used if there is a great deal of cloud interference either.

The most powerful of these optical devices to be used up until now is the 200 inch Hale telescope at the Palomar Observatory. It can penetrate about two billion light years into space, if proper conditions exist. The newest development in equipment to survey the sky is the radio telescope. It can, at least theoretically, gather data from nearly eight billion light years away. This opens a whole new area to exploration, and it will, perhaps, give us a fur-

ther clue as to how the universe actually functions.

The radio telescope sounds simple to build and use. All you need is a high gain antenna, which receives and focuses the wave, a sensitive receiver system to take the signals from the antenna, and a data processing system to record the data. It would seem with our modern science that these things would be easily taken care of. The receiver and data processing apparatus are taken care of without too much trouble. However, the antenna poses many problems because of the great size demanded.

There are many advantages to the radio telescope over the optical telescope. As mentioned earlier, a regular telescope must have very nearly perfect conditions before it can be used. About the only conditions affecting the radio telescope are wind, and radio interference, if they are too close to a broadcasting source here on earth. While the optical telescope cannot penetrate, the radio telescope can penetrate through gasses and other things which a telescope could not penetrate, even if it were close enough. An example of how this is useful is in the study of our own sun. Inner portions of the sun are studied to give us much more information on the life of the sun, activity there, and how it affects us here on the earth.

There are many sources of radio waves in the universe. One of these is colliding galaxies. These galaxies

emit amazing amounts of energy, but perhaps the most amazing fact is where this energy comes from. It does not come from the collision of stars in the galaxy, but from the collision of the minute particles and gasses existing in the space between the stars. An idea of the distances and amounts of materials involved can be seen from the fact that the space between the stars is a vacuum, far more perfect than any one ever developed here on the earth. Therefore, the distances would have to be very great to amass enough material to release the amounts of energy that are released. Here on earth, a radio station of 50,000 watts is considered powerful. However, one colliding galaxy alone is broadcasting at a power of 10^{36} watts.

Another source of radio waves in the universe is the so called radio star, of which there are a great many. Our sun is one of these stars. It has been assumed that there are other stars also which emit these waves. They can be found because of the phenomena that waves of greater intensity are emitted from certain definite points in the universe. Many of these radio stars are too far away to be identified by optical telescopes.

Within our own solar system, some of the planets emit these waves. Jupiter produces signals from violent storms in her atmosphere. Venus emits several different types of signals, and Mars emits waves because of thermal disturbances.

ASTRONOMY

By Larry Berger, jr., e.e.

Even our own moon emits some radio waves. However, they are quite weak.

Perhaps the most important one development to stem from the radio telescope is the discovery of a "bright line" in the radio spectrum. Nearly all persons of a scientific bent are familiar with the use of a diffraction grating to separate the spectrum of light into its "bright lines." The "bright line" in radio waves from space is distinguished by an especially strong signal. The only "bright line" discovered at the present time is the "line" of hydrogen. It occurs at a wavelength of about 21 centimeters. Although it is the only one discovered so far, as in light's spectrum, scientists expect to find many more.

The hydrogen "line" is of particular importance. It has long been established as one of the fundamental building blocks of the universe. It is the most abundant element in both our galaxy and many of the others. Thus, much of the use of radio astronomy is to study hydrogen gas clouds, and to determine their relationship with other parts of the universe. Much could be learned of stellar evolution from a study of this type.

There are two definite kinds of radio telescopes. They are the interferometer and the paraboloidal.

The interferometer was the first discovered. It was discovered accidentally by Karl Jansky in about 1932. It consists of two antenna

spaced some distance apart, and a radio receiver coupled with a data recorder. It operates on about the same principle as the diffraction grating as studied in optics. This type has several disadvantages. It is not steerable, and must operate on a fixed wave length.

The paraboloidal telescope overcomes both of these disadvantages. It can be made steerable, and will operate over a large frequency range. It consists of a steerable supporting mechanism, and a large parabolic reflector which focuses the waves on an antenna located at its center. It is also coupled with a receiver and a data processor.

The size of the reflector is an important factor in the efficiency of the overall system and to length of waves that can be received by the system. To give an example of the sizes, sensitivities and engineering problems involved in the construction and design of these telescopes, we shall consider the Jodrell Bank radio telescope in Manchester, England.

This telescope is the largest telescope of its type ever built. The large parabol reflector is 250 feet in diameter. The entire surface of the parabola is covered with 7100 steel plates. An idea of the tolerances is obtained from the fact that in a 46 mile per hour wind, the deflection of the center of the parabola cannot be more than one half of one inch. There are provisions made for adjustments which will normally

maintain tolerances of within one quarter of one inch.

Since the reflector involves such close tolerances and such great weight, the supporting framework had to be very strong. The reflector alone weighed 800 tons, and the supporting structure weighed 1000 tons. To support this terrific weight, 152 concrete piles each having a bearing capacity of 76 tons was driven from 37 to 97 feet into the ground.

The reflector was mounted on a track to provide for the rotational movement. The track is 352 feet in diameter. The maximum tolerances permitted were one sixteenth of an inch in line and level.

The framework holds the reflector 165 feet in the air. The reflector is controlled by two sets of gears, one controlling elevation and one controlling rotation. It rotates from horizon to horizon in 15 minutes, which is just fast enough to track satellites. This telescope was used extensively to track America's Pioneer rocket, and also received signals from Sputnik I.

The paraboloidal telescope is most limited by its inability to receive some wave lengths because of the dependence on the diameter of the reflector, and distortions at the center of the parabola. This type of telescope also has poor resolving power, which is the ability to distinguish objects. A radio telescope, to have the resolving power of an optical telescope such as the Hale

(Continued on Page 33)

ALPHA TAU OMEGA

Nearly all the Alpha Taus have weathered the storm of final examinations, but things still have not returned to normal at the Tau house. The whole chapter is looking forward to rush, February 14-15, and the opportunity to talk with all the freshmen going through rush and welcome a good many of them as Tau pledges. In preparation for rush, all the energy that was used for studying before finals has now been shifted to improving the house.

Over semester vacation several of the study rooms were painted, the rewiring of the dormitory was completed, and several other painting and fixing jobs were done. ATO wants to welcome the freshmen with a shining house!

The Alpha Tau basketball squad has had some tough luck, losing two of three close basketball games. The interfraternity league certainly appears well-balanced this year. The Taus lost to Sigma Nu 35 to 32 in the first game; in the second outing ATO won a squeaker over Lambda Chi Alpha—33 to 32 in an overtime. Bob Mewhinney hit the winning free throw for the Taus in the extra period. In the third game we were defeated by Theta Xi in another close game by one point, 37 to 36. It is easy to see that anyone can win the basketball trophy yet; with a little luck Alpha Tau Omega might bring home the prize.

Congratulations to the Taus in high positions on the new staff of

the ROSE TECHNIC: Larry Berger and Ron Staggs are co-editors; Marshall Garino is business manager; Dave Trueb is one of the assistant editors; Sherm Smith is the circulation staff head; and Bill Johnson is the advertising manager.

Cupid caused two ATO's to lose their pins over Christmas vacation: Jim Burns is pinned to Miss Madonna Woodruff and Bill Carter gave his pin to Miss Ann Wojahn. Brother Larry Berger took a more binding step and became engaged to Miss Jackye Murphy. Congratulations and best wishes to Jim and Madonna, Bill and Ann, and Larry and Jackye!

Ed Note: Congratulations also to Bill Perkins who became engaged to Miss Phyllis Swinford.

Bill Perkins

LAMBDA CHI ALPHA

One down and one to go. Everyone at the Lambda Chi house is glad to see the second semester start. After the finals of last semester, there is new spirit as we start anew.

Congratulations to Dick Kirby. Dick is pinned to Pat Junker, who is a nurse at Union Hospital. The event took place on January 12.

The improvements in the Theta Kappa house are coming along fine. During the semester vacation, several of the brothers completed the

basement and installed a new hot water heater and showers. Improvements in the basement included: adding more floor space, repainting, and a flower box for decoration.

The Lambda Chi basketball team will take part in the Indiana Lambda Chi tournament at Evansville. It will be on February 21. Chapters of Lambda Chi from all over Indiana will attend this event. The Iota-Mu Zeta, the Evansville chapter, is having a dance for their guests after the tournament.

The Theta Kappa has a new house mother. She is Mrs. Herrin from Terre Haute.

Jim Gates and Bob Checkley are now members of the science departments. Jim is majoring in math, and Bob is majoring in physics.

Well, that takes care of the news from the Lambda Chi house for now.

Steve Burton

SIGMA NU

Lets get right down to business this time and lead right into the latest hot news on hot pinnings. Brother Waldbeiser was pinned to Miss Pat Gor; Brother Ron Higgenbotham was pinned to Miss Phyllis Quick.

To progress a little further, Brother Onnen is now engaged to Miss Melanie Fesler, and Brother Kurtz announced his engagement to Miss Judy Gephart. In the last issue I mentioned Brother Tom Hormouth's

Fraternity Notes

marriage, and in this issue, I can even beat that one. Brother Don Slack and his wife Marcella have just given birth to a new member of the family, little Miss Lisa Ann Slack. To all these, we offer our warmest congratulations!

Now that all the guys are back from the semester break, what a bunch of stories came back at the same time. Vacations in Florida, New Orleans, New York, and all, it sounds like escapades from the Blue Book set. But it's over and here we are once again getting sore necks and headaches from staying up and hitting all the bar (oops) books.

The basketball team is still going strong under the excellent coaching of Brother Kurtz. Bros' Miller, Brown, Kirk, Onnen, Landenburger, Kvasnica, Smith, Gilbert, Herrington, and Yochum have been dropping the old round ball through the hoop with astounding regularity, and are all doing a great job. Needless to say, we are not in any danger of not having sufficient players.

Once more the house is getting a new look on the inside, and all the Snakes have really pitched in and pushed their ol' paint brushes around. It's a lot of work, but it's a lot of fun, also.

The big month is on us again, and the rush talk is going on strong. I'd like to say, once again, to all of you aspiring to enter the brotherhood of fraternal spirit and ways, choose wisely and carefully, as your deci-

sion will be important to you both now, and in the future. We all welcome your decision and know that it is worthy of both your ideals, and your serious thought and considerations. You all have a lot to learn in the coming months, but it's worth all the time and energy you will put into it. It's time to go now, so—'til next issue when I'll see you again, Bye now—

Fred Ryker

THETA XI

Well, the exams are over, and for those who survived, it's another semester of hard work and grind. The boys of 902 South Sixth extend their heartiest congratulations and best wishes for another successful semester at Rose.

With the beginning of the second semester several new men have moved into the house adding additional harmony and spirit. Those new men gracing the TX halls are Bob McCardle and Jack Schreiner.

Many new improvements were made on the house during the semester break. We accomplished a lot and had a swell time doing it. Thanks to all the guys who gave a helping hand.

Congratulations go to the new initiates; John Fiddler, Perry Foltz, and Ed James. We are all very glad to have you with us men.

Congratulations also go to Larry Wilson on his engagement to Miss

Sharon Sandberg and to Dale Starks on his engagement to Miss Janice Council. You lucky, lucky guys!

The Theta Xi tigers are rolling right along in the interfraternity basketball league with one victory and one defeat. Let's not have anymore defeats men, only victories.

In this issue we say farewell to two of our Theta Xi's, brothers Matthews and Pierson. Brother Matthews is transferring to Butler University and Brother Pierson is stepping out into the world as a full fledged engineer. We, who hope to be around a little longer, wish you the best of luck.

It looks like a promising year in both the social and sports departments of Theta Xi. Brothers Herman and Lanning, both "cool cats", have taken their positions as social chairmen and are bubbling over with many swell ideas. Well, you are, aren't you? Brother Schmidts, who is a professional referee, expert in the fields of basketball, football, baseball, and, er . . . eating, heads the sports department this semester. One thing for sure, we'll know the rules.

"Well, now that rush is over, we hope everyone is well satisfied with their choice of a fraternity, and we know those who chose Theta Xi are.

I guess that's all of the tiger growls for now, so until the next issue, so long you . . . all.

Larry Pitt

MILITARY

BALL

1959

One of the major social events of the year is coming February 28, 1959. It is the Military Ball which is sponsored by the Rose student chapter of the Society of American Military Engineers. This annual dance is formal and will be held in the Mayflower Room of the Terre Haute House from 9:00 P.M. to 12:00 P.M.

The highlights of the dance include the O'Grady Drill and the presentation of a gold medallion to the Honorary Cadet Colonel. The O'Grady Drill has always provided a lot of fun and entertainment for everyone in attendance, and a prize is awarded to the winner of the contest.

The Honorary Cadet Colonel is elected at the dance by ballot. The name of the candidate of your choice is to be written on the back of your ticket and turned in when you arrive at the dance. A poster with the pictures of the candidates is on display on the bulletin board, and it will also be placed near the ballot box at the dance. Major General Theodore Riggs will be presentation of the medallion. The Honorary Cadet Colonel is present at all major inspections and presentations of awards during the school year. Miss Molly Strate is the Honorary Cadet Colonel at the present. Tickets for the dance may be purchased from any member of S.A.M.E., and every student is invited to attend.

(Continued on Page 39)

JO REDENBARGER

Jo Redenbarger is A company's nomination for Honorary Cadet Colonel this year. Miss Redenbarger is from Rushville, Indiana. She graduated from Broad Ripple High School in 1955. She is now a senior at Indiana State Teachers College, where she is a member of the Delta Gamma sorority. She has many hobbies which include music, travel, and books. She also enjoys spelunking, bridge, and chess. She was nominated by Dick Brown.



MARLENE VUKOVICH

Carl Herakovich nominated B company's candidate for this year. She is Marlene Vukovich. Miss Vukovich is from East Chicago, Indiana, where she graduated from East Chicago Roosevelt High School. She is a sophomore in elementary education at Indiana State Teachers College. She is a member of the Delta Gamma sorority, and was co-director of the D G homecoming float this year. She is also a member of the student council and a varsity cheerleader. Her outside interests include dancing, skating, swimming and water skiing.



JANET MINER

C company has nominated Janet Miner for Honorary Cadet Colonel. Miss Miner is from Ridgeway, Illinois. Miss Miner is a member of the Chi Omega sorority at Evansville College. She is majoring in mathematics and physics. She is a cheerleader, a member of college Who's Who, and a member of "Angel Flight" A.F.R.O. T.C. She enjoys all sports, dancing, and buying clothes. She was nominated by Larry Cunningham.



what is temperature?

A thermometer reading?

Internal motion
of body particles?

What is absolute zero?

What happened to the
3rd law of thermodynamics?

How is temperature defined
in the "pinch effect"?

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Campus Survey

By Gary Phipps, jr., e.e.

My first article of this type, rather than the straight reporting of club meetings and such, appeared in the last issue, and a few comments were heard about "cutting people down." I hope that not too many people got this idea, as it is not my intention to be a rabble rouser or anything of the sort. After all, I have to pass a few courses. Seriously, I think that legitimate gripes and constructive criticism should have a place in any college publication.

By the time this issue comes out, the second semester will just be getting started. This second semester is a little more interesting than the first, at least from the social side of the picture. After rush on February 14 and 15, many freshmen will have at least one outside interest and a little closer relationship with upper-classmen. The Military Ball, St. Pat's Dance, Junior Prom, and the Interfraternity Dance provide a little diversion from the books.

The Military Ball, sponsored by the student chapter of S.A.M.E., will be held at the Mayflower Room

of the Terre Haute House on Saturday, February 28. Highlights of the dance will be the traditional O'Grady Drill and the presentation of a gold medallion to the Honorary Cadet Colonel. Tickets may be purchased from any member of S.A.M.E. The dance is formal, and the entire campus is invited to attend. The Military Ball promises to be one of the outstanding dances of the year.

The St. Pat's Dance this year will be held on March 21. St. Pat's Day is celebrated by many engineering colleges in honor of St. Patrick, the first engineer, who drove the snakes out of Ireland. The customary beard growing contest will begin on February 16 and terminate with the judging at the dance. Two prizes will be awarded—one for fullest growth and one for the beard with the most "character." A reliable source has informed me that the price of admission will be fifty cents less for anyone wearing a beard. The dance is usually one of the highlights of the Rose social whirl. I might add that the dance is sponsor-

ed by the Blue Key Fraternity. Blue Key members are starting their beards two or more weeks early. I understand this is because none of them can cultivate a decent growth in the same time allotted everyone else, even if they say it is for publicity.

Now that the second semester has begun and we all have a fresh start, it might be a good time to really "gun" for a while. A lot of fellows say that how they study at Rose is their business. Take, for instance, the fellow who sleeps in class and skips quite a bit. He's lucky if he's getting 50% of what he could get out of the class. And when one thinks of all the applicants that Rose turns down each year, we were lucky (yes, lucky) to get accepted. It makes one wonder if he shouldn't "put out" a little more effort.

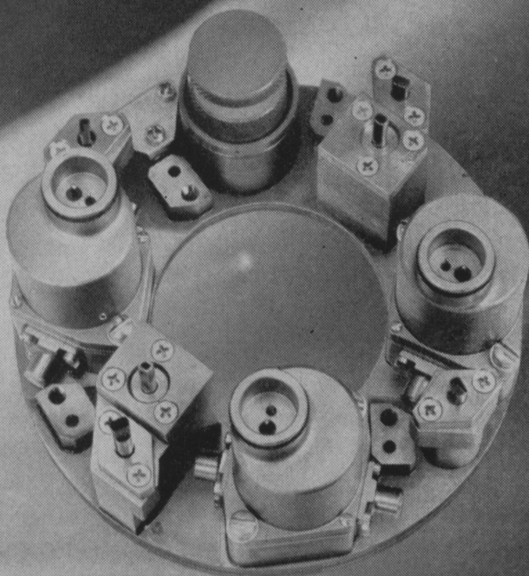
Another common gripe is about the amount of money it costs to attend Rose. In the first place, Rose costs less than most other private engineering schools. If for no reason than the amount of money spent, we should all do our best to get the most out of school. And when we consider that some alumnus is putting in a dollar for our education for every dollar we put in, we owe it to that alumnus to do our best, so that his money is not wasted. We are the alumni's investments, and we should do our best to pay off by receiving the best education possible. Anyone who is staying at Rose and not do-



I.S.T.C. Choir

(Continued on Page 29)

CREATIVE ENGINEERS



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.

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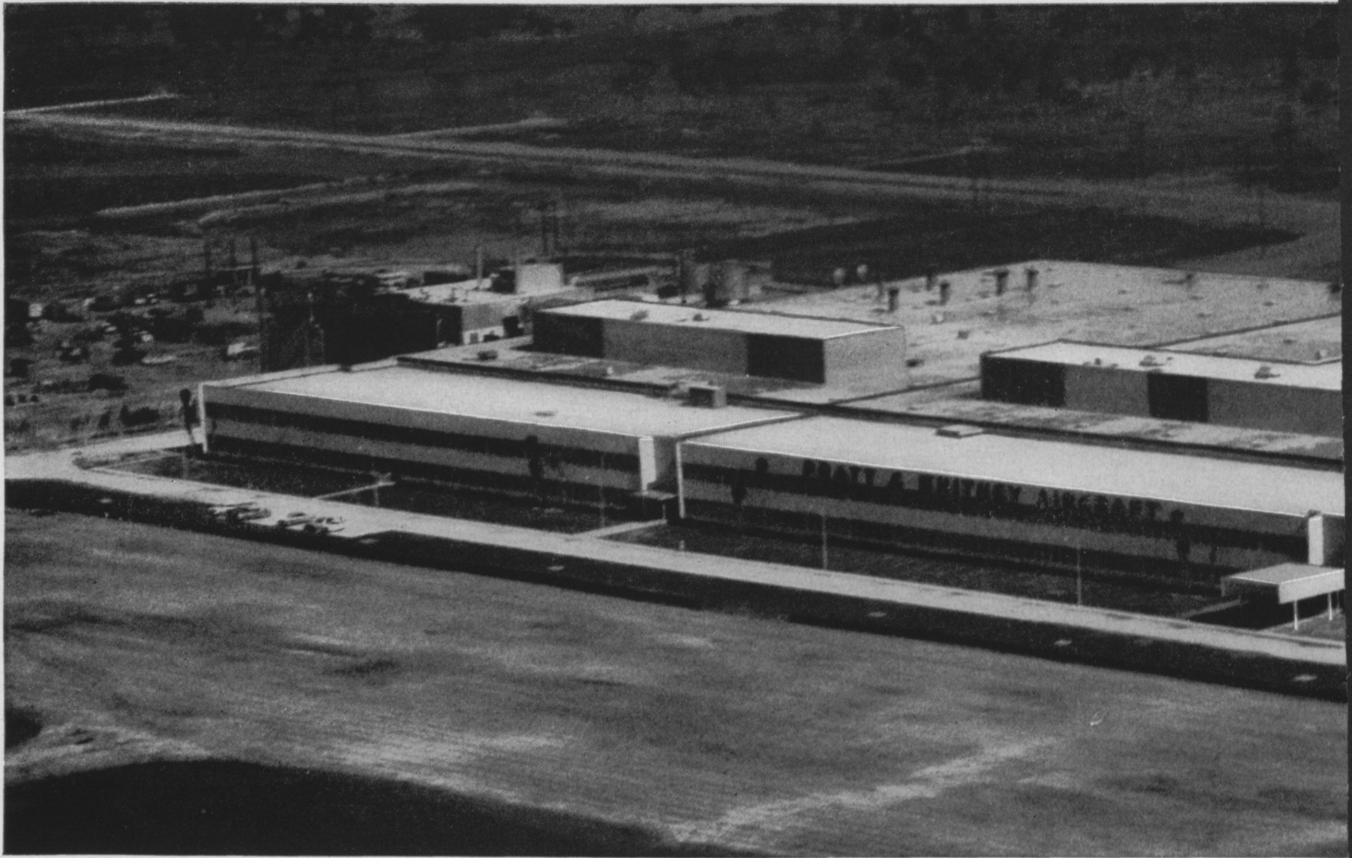
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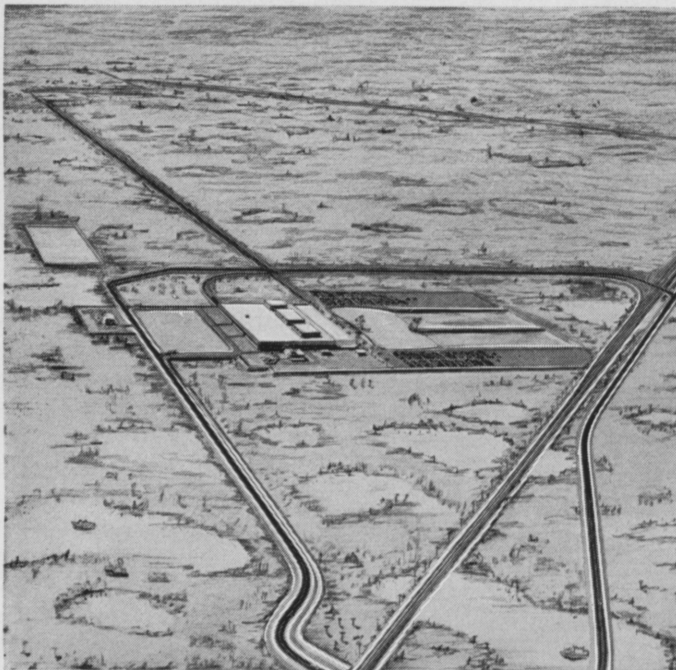


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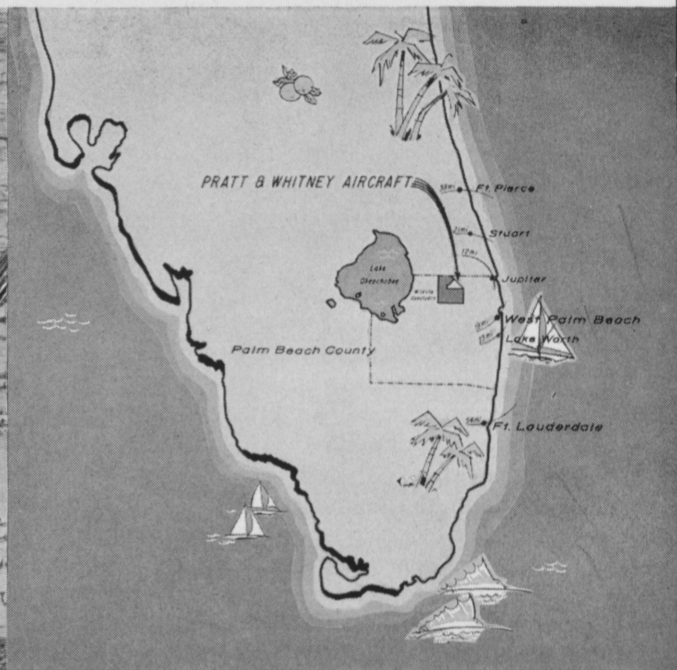
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FLORIDA RESEARCH AND



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.



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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.

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Research & Development

By Lanny Snapp, jr., e.e.

PHYSICS TAUGHT ON A COAST TO COAST TV SET UP

The facilities of a major television network have been turned into a three million square mile classroom for a full credit college course in atomic age physics.

Called Continental Classroom, the program is telecast across the country every morning from 6:30 to 7:30 by the owned and affiliated stations of the National Broadcasting Company.

The course is being offered for credit by more than 300 colleges and universities and will cover two semesters of physics review—from a discussion of experimental method to a lecture of inertial guidance systems.

It is the first time in the history of television that a full year course in any field of education has been offered to the general public on a nation-wide basis.

Conducted by Dr. Harvey E. White, Professor of Physics at the University of California at Berkeley and consultant to the Atomic Ener-

gy Commission, the course started October 6 and will run through June 5, 1959. Occasionally, during the class year guest experts, drawn from the ranks of the nation's leading physicists, will conduct special lectures.

Experiments and demonstrations presented with standard teaching aids and unusual scientific instruments are an integral part of the daily lectures. Unique among the devices being used is a standard engineering drafting machine adapted to fit Continental Classroom's 21-foot blackboard. Called the Paragon Auto-Flow, the machine's protractor and drawing rule have been equipped with oversized calibrations and numerals for easier reading on camera.

Officials of the Keuffel & Esser Company, manufacturer of the Auto-Flow, say Continental Classroom is a challenging and rugged proving ground for many kinds of scientific demonstration devices.

Keuffel & Esser Company also made the seven-foot demonstration slide rule employed in engineering schools throughout North America.

During the first semester Continental Classroom will stress those physical principles necessary for an understanding of atomic and nuclear physics: kinematics, light, dynamics, electricities, hydraulics, and magnetism. In the second semester emphasis will be on atomic and nuclear physics. Television lectures will be supplemented by tests ad-

ministered by the colleges, textbook assignments, problem solving and other out-of-class activities.

In the opening session of Continental Classroom, Dr. James R. Killian, Jr., Special Assistant to President Eisenhower for Science and Technology, called the show "truly a bold experiment in the nation's interest."

"We need more and better teachers and students of physics in the United States if we are to realize the potential inherent in science," Dr. Killian said as guest on the premiere telecast.

Continental Classroom is sponsored jointly by NBC, The Ford Foundation, the American Association of College for Teacher Education and the Fund for the Advancement of Education.

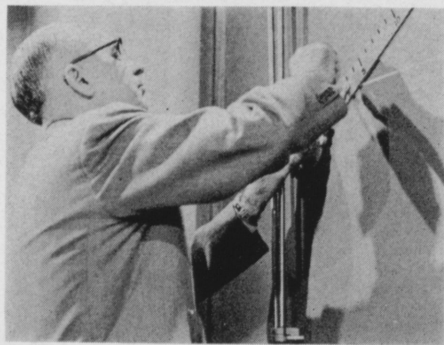
Participating colleges and universities may utilize the program at no cost and may charge regular tuition fees for those registering for credit. The AACTE recommends that a minimum of three hours of credit be given each semester; however, the amount of credit a college or university offers will be determined locally.

The telecasts are produced in NBC's New York studios.

NUCLEAR RESEARCH

Nuclear specialists in the Babcock and Wilcox Company's Critical Experiment Laboratory in Lynchburg, Virginia, are shown pre-

(Continued on Page 34)



Dr. Harvey E. White



W.E. DEFENSE PROJECTS ENGINEERS are often faced with challenging assignments such as systems testing for the SAGE continental air defense network.

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In our main job as manufacturing and supply unit of the Bell System, Western Electric engineers discover an even wider range of opportunity. Here they flourish in such new and growing fields as electronic switching, microwave radio relay, miniaturization. They engineer the installation of telephone central offices, plan the distribution of equipment and supplies . . . and enjoy, with their defense teammates, the rewards that spring from an engineering career with Western Electric.

Western Electric technical fields include mechanical, electrical, chemical, civil and industrial engineering, plus the physical sciences. For more detailed information pick up a copy of "Consider a Career at Western Electric" from your Placement Officer. Or write College Relations, Room 200D,

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.



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Alumni News

By Robert Checkley, soph., m.e.

'15 Ruel F. Burns is currently on a safari into the game fields of Africa. His party left Nairobi, Kenya Colony, on December 30, to try for the big five; elephant, rhinoceros, buffalo, lion, and leopard. Mr. Burns is vice president and production manager of the Weston Paper and Manufacturing company.

'16 Sidney C. Leibing has been appointed Secretary of the Registration Board for Professional Engineers and Land Surveyors of the State of Indiana. This board is responsible for protecting the public interests in so far as the practice of engineering, as it affects the public, is concerned. The board conducts examinations of those qualified to practice professional engineering, who have applied for registration.

Mr. Leibing was associated, since graduation, with General Electric until 1958. He had made a career of devising ways to apply electrical systems and products to processes of various types.

'19 Mr. De Witt Pattison Cromwell has been appointed Bailey associate professor in the department of metallurgical engineering at the University of Pittsburgh.

For the past forty years, Mr. Cromwell has been active in the management and study of the operations of major blast furnaces. From 1919 to 1958, he was superintendent of blast furnaces for Youngstown Steel and Tube Company, manager of Coke Ovens and Blast Furnaces

for the Ford Motor Company, and manager of sales in Ohio of the William M. Bailey Company. He is the author of the book, *Coke Evaluation Survey*, which was published in 1953 by the American Iron and Steel Institute.

'22 Conald L. Griffith, who is employed by National Malleable and Steel Castings Company, has become sales coordinator and will be assigned to follow expansion programs among the Industrial Division's customers.

Mr. Griffith joined National Malleable in 1922, immediately after graduation and was made Cleveland Works sales manager in 1942.

'23 Mr. J. L. Tygart is now Construction Engineer with Aeronutronics Systems, Inc., a subsidiary of the Ford Motor Co. As a result of his job change, Mr. Tygart has moved from Michigan to California.

After a number of years in the Plant Expansion Program of Ford Motor Co., he has been transferred to its subsidiary, A.S.I. to have charge of its construction program in southern California.

'34 Howard C. Barnes has been promoted to assistant head of the Electrical Engineering Division of American Electric Power Service Corporation in New York. He is a veteran of 19 years service with the electrical system.

Starting with the A.E.P. system in 1939 as an assistant engineer of Ohio Power Company, he moved to the A.E.P. system general offices in

New York City in 1944 as an engineer. He rose to senior engineer and then to head of the Relay and Protection Section in 1950.

'38 Dr. Lawrence J. Giacoletto, who is manager of the electronics department at Ford Motor Co. scientific laboratory, has been named chairman of the Detroit section of the Institute of Radio Engineers.

After receiving his B.S. in electrical engineering here at Rose, Dr. Giacoletto went to the University of Iowa where he received a M.S. in 1939. Not until 1952, did he obtain his Ph.D. from the University of Michigan.

'47 Prof. Thomas E. Duwelius has recently been elected secretary of the Indiana section of the American Society of Civil Engineers. In addition to the B.S. in civil engineering that he received here at Rose, he has a M.S. from the University of Illinois.

'52 Leo E. Little is now working for Aerojet-General Corp. in Sacramento, California. Aerojet-General is a division of the General Tire Corp.

'52 We recently received a letter from Bob Miller, who is working in Australia on a development project. He is employed by Kaiser-Perini-Morrison-Raymond Company as assistant Project Manager for the Australian venture.

The project of which Bob is Assistant Project Manager is a T-2

(Continued on Page 37)



... a hand in things to come

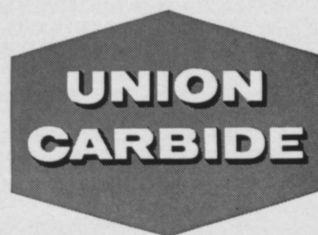
Unlocking the secrets of the universe

Amazing textile fibers spun out of natural gas . . . wonder drugs squeezed from coal . . . shining stainless steel forged from drab, brownish earth. These man-made marvels were born in the minds and hands of research scientists.

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... a hand
in things to come

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AMERICAN ELECTRIC POWER SYSTEM (Formerly 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. Beehler (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, BSEE '54) and Robert O. Meador (Tri-State, BSEE '49) supervise installation of underground distribution facilities.

5. New York City—NUCLEAR POWER ENGINEERS

John R. Struyk (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. Amchin (Penn State, BSEE, '46; IIT, MSEE '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 (VPI, 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. Bissinger (Michigan College of Mining and Technology, BSEE '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. Schlomann (MIT, SMEE '56) discuss means for reducing radio influence on 345 kv transmission lines.

CAMPUS SURVEY

(Continued from page 20)

ing his best is not only hurting himself and fellow students, but also the people who have placed their faith in him by helping to pay for his education.

One can't help but notice the enthusiasm and high morale of the math majors around school. Math club meetings are better attended, percentage-wise, than any of the student professional societies. I feel that this fine attitude is due to the interest shown in the students by the math department faculty. It just makes a person feel like working a little harder if he knows his faculty and advisor are pulling for him rather than not caring. It's too bad that several professors are so tied down with a heavy teaching load and many faculty committees and other things that a little closer bond between the student and advisor couldn't be built up. This is especially true of the first two years, when the student is just getting acquainted with his department. There has been much talk about how the pure sciences might tend to draw good students from an engineering curriculum, and this may eventually happen at Rose. But right now it appears that it is the greater interest expressed by the pure science department's faculties in their students that may be drawing good students from other departments.

At the convocation on January 8, Dr. Charles Vitaliano lectured on "Volcanoes and Volcanic Rocks." Along with the lecture, many interesting slides were shown. Dr. Vitaliano is with the Department of Geology at Indiana University. The lecture series is sponsored by the I.U. Sigma Xi.

The Military Department has been making several interesting films available for showing to any interested persons. One of these films, "Army Explorers in Space," told the story of the development and launching of the Army's earth satellite, "Explorer." Films of this type are certainly of interest to every engineer.

FEBRUARY, 1959



Westinghouse-proposed solar sail may permit 60,000 mph speeds in space... and it will need no fuel at all!

Lunar reconnaissance—and manned lunar colonies—may become realities in the not-too-distant future.

But the exploration of deep space is entirely another matter. Distances are tremendous—fuel requirements for chemical rockets are staggering—navigation must be almost unbelievably precise.

As a partial answer to these problems, a Westinghouse scientist has proposed the use of a solar sail which will harness the light of the sun. This sail will require no fuel, it will be capable of fantastic speeds, and its design will permit in-flight navigational corrections. More important, this Westinghouse approach could be cheaper and simpler than any other system proposed for this same purpose.

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Library Notes

By Carson W. Bennett and Anita Walden

Having trouble writing a technical report? In the June, 1957 issue of *Foreman's Digest*, Ted Armstrong, News Editor of the *Oil and Gas Journal*, listed three fundamental rules to consider in writing the technical report.

The first rule is: *Write to express, not to impress.* Another way of saying this first rule is: "Write like you talk." Each of us is fluent, clear, and understood when speaking casually to a friend. But when we write him a memo, we are inclined to become complex, to lengthen our sentences and to choose more ponderous words. We must remember that, just as in casual speech, there can be dignity in our writing without pomposity.

The second rule is: *Organize your material for logical reading.* Put the conclusion first. All the supporting material can then be added according to its importance to the reader.

Rule number three is: *Write it simply.* How do you write simply? There are two basic rules.

First, use short sentences. Long sentences tend to tire the reader. But there should be a variety in sentence length. If all sentences were short ones the material would sound choppy.

The second rule is: Use little words. Is this ridiculous in technical writing? Where one long scientific term is the best possible word, use it. But where a little one does the job just as well, give it preference. The appeal here is to drop only the unnecessary long words. Engineers,

for example, are fond of "unavailability." "Lack" would do just as well. For example, "Unavailability of casing delayed initiation of the drilling operation," might easily have been, "lack of casing delayed starting the well."

After you have finished writing, be your own editor. Analyze your work. Put yourself in the position of the reader and see if he is going to stumble or get lost.

Get out your black pencil. Put periods in the middle of long sentences; change unnecessary big words to smaller ones; shorten your paragraphs.

If you're concerned because writing is hard for you, relax. It's hard for everybody who is trying to do his best. And the hardest job of all is to take technical material, analyze it, and write it in clear, simple and understandable fashion.

For a more complete and formal discussion of the aspects of technical report writing, here is a partial list of the library's holdings on the subject.

Ball, John. *Report Writing.*

This volume is based on a general, functional approach to report writing.

Blickle, Margaret D. *Reports for Science and Industry.*

This report has been written for those who have had experience in compiling reports and for those who are dipping into the subject for the first time.

Crouch, William George. *Guide to*

Technical Writing.

This book, a guide to the principles and mechanics of good technical writing, is designed to fit the needs and interests both of undergraduates and of those already in business and industry.

Hendricks, King. *Technical writing.*

This is designed as a textbook for the student in technical writing and at the same time as a quick reference manual for the experienced research worker.

Kobe, Kenneth Albert. *Chemical Engineering Reports*

Within this report is presented material on the literature of chemistry and chemical engineering and its assembly into a report. Emphasis is given to the preparation of an effective report through good writing, attractive styling of the report and its illustrations, and complete citation of the literature from which the information has been secured.

Linton, Calvin Darlington. *How to Write Reports.*

This is a practical book designed to help everyone who writes reports to improve his effectiveness. Its principles and methods are equally applicable to government employees, businessmen, scientists and military personnel.

Miller, Walter James. *Engineers as Writers.*

This was written for the purpose of motivating engineering students by a study of the structure and style

(Continued on Page 37)

RUNNING SCARED

(Continued from page 11)

Do you know what happens then, even in some cases after the supervisor or manager has carefully explained the whole situation? The inherently more able man who has been bypassed goes around muttering under his breath about eager beavers who spend all their time trying to make themselves look good to the boss!

My second point was that it is more fun to run scared than to feel secure. Let's not interpret that as a plea that you develop ulcers at thirty. But if you feel responsible, you will feel that you really count for something. That is a way that most of us human beings need to feel.

If you feel responsible, it helps to fix your thoughts on the thing for which you are responsible, which makes for mental health. The man who shuns responsibility easily gets to thinking about himself more and more, so that he enjoys life less and less.

It always has seemed to me that there was an impressive psychological truth behind the Biblical statement that, "He who loses his life shall gain it." I would paraphrase this as: "He who loses himself so completely in living that he identifies himself with what he is trying to accomplish, really lives."

Long before this, you have realized that my title was obviously created to stir your curiosity. Long before this you have begun to wonder when I would quit beating to death this idea of reaching out for responsibility. The answer is: in about four seconds. But first let me urge you that you never utter the famous phrase, "Let George do it," unless your name is George.

BREATHE ON THIS SPACE
FOR ONE MINUTE. IF IT
TURNS GREEN, BRUSH YOUR
TEETH!



Westinghouse Astronautics Institute now probing basic problems of interplanetary travel

It was a wise man who first said, "A problem well defined is half solved."

Space exploration is no exception to this rule. Many of the complex activities at Cape Canaveral and our other missile test sites are devoted to better defining the problems involved in space flight.

Westinghouse, for its part, has established an Astronautics Institute to investigate such matters as space craft stabilization, orbital injection, space guidance and communications, the equipment needs of a manned lunar colony, etc. This Westinghouse group has already made significant contributions toward a better understanding of space problems. It has also developed a number of solutions.

FEBRUARY, 1959

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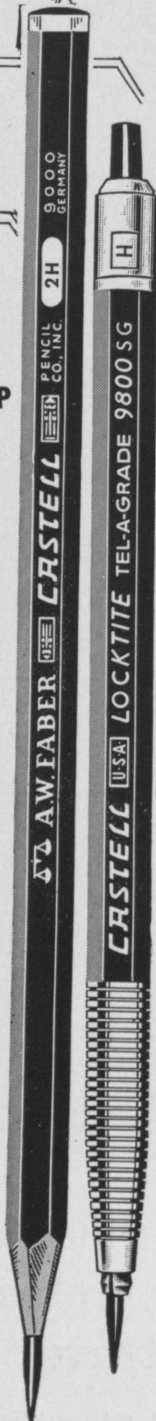


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Locker Rumors

By Woody Stroupe, jr., ch.e.
And Hal Booher, jr. e.e.

Rose suffered its seventh loss in eight starts as it traveled to Eureka, 60-53. The Red Devils led 28-27 at the halfway mark and the Engineers remained within two or three points until the last 3 minutes, when Eureka pulled away.

Although the Engineers hit only 27%, they outscored the hosts by 8 points from the field. The game was decided at the free throw line. Rose committed 26 costly fouls, while Eureka was only whistled for 13.

Sherm Smith was high for Rose with 17 points with Jim Sargent and Woody Stroupe following with 11 and 10 points respectively.

INTRAMURALS

The fraternity basketball league appears to really be a rough one. The majority of games so far have been won by one point margins. Tx and Sigma Nu lead so far with a 2-1 record, but Lambda Chi and ATO are close behind with 1-2 records. Any one of the four teams could easily be the winner.

In intramural basketball it too seems to be a tossup as to who will lead at the end of the season. Four teams are still undefeated. The seniors with 4-0, the Junior Hawks with 4-0, the Sophomore Lakers with 3-0 and Junior EE with 2-0. Each team will play every other team once and then later next semester, there will also be a tournament.

There haven't been many volleyball games played, but so far in the college league which counts for I.

M. points, the Seniors and Juniors both have won two games for two. Counting all games played the Juniors have won 3 for 3 and Demeter's team is second with a 3-1 record.

After several weeks of bowling, Kuchar's team is still out in front. For the faculty, Galginatis's team leads with a 7-0 record. Blake's team finally lost a game to give them six wins in seven attempts. After the third week the highest bowler for a week was McLellen with 823. The highest team series for two games excluding faculty also runs under the name of McLellen with 1499. Blake's team for the faculty had the highest series for two games with 1528. The individual high scorer for one game after three weeks of bowling was Phillips with a score of 215. Phillips also had the high series with 397.

Intramurals and all activities have slowed down somewhat because of finals, but everything should be back in full swing starting in February.



Sherm Smith scores for Engineers

RADIO ASTRONOMY

(Continued from page 15)

telescope, would have to have a reflector the size of the Pacific Ocean.

The signals picked up by the radio telescope are relatively weak, because of the great distances involved. There are several methods of increasing the efficiency of these receivers. The reception can be improved ten times through the use of a maser. This is a new type of amplifier which derives its name from 'microwave amplification by stimulated emission of radiation.' It has a very low internal noise level about one tenth of that of normal equipment.

Another method used successfully is to combine the paraboloidal and the interferometer types. Two paraboloidal systems are set up some distance apart. Since the signals come in at different angles, and at some times the signals will add, and sometimes the angles will subtract, when they are adding, you have a signal which is twice as strong. Also, a great deal of information can be obtained from the pattern made as a source from outer space crosses the field of such a system.

As can be seen, there are endless opportunities in the field of radio astronomy. A man can be a civil engineer and construct the giant antennas, or he can be an electrical engineer and construct and design the sensitive receivers and data collectors.

However, the greatest of opportunities and rewards lie in the actual use of the equipment, and the deciphering of the information, which these gigantic pieces of equipment can give us. Here is the place for the men of great minds who can project themselves into this universe of ours and develop a knowledge of what the universe is really made up of.

It will take great men with even greater minds and devotions to their tasks. Perhaps, with these minds coupled with such developments as the radio telescope, we will eventually obtain more than our present meager knowledge of what is going on "out there."

FEBRUARY, 1959



Westinghouse develops new skin for space craft...so they won't burn up re-entering earth's atmosphere

At 6,000 mph, air friction is a problem for space craft re-entering earth's atmosphere, because skin temperatures can exceed 2,500°F. Without adequate thermal protection, the incoming space vehicle will burn itself up like a meteor.

Westinghouse has developed a new ablative material for use as the protecting outer skin for space craft. It has already been service-proven in actual re-entry tests involving firings of ballistic missiles equipped with nose cones of this material.

This new Westinghouse development should do much to help advance our nation's space exploration effort.

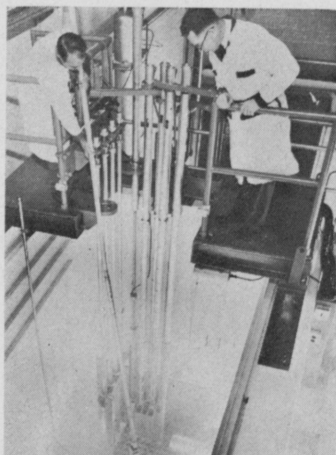
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RESEARCH & DEVELOPMENT

(Continued from page 24)

paring to test the properties of reactor core materials. At upper left, Technician Lester Trout stands on the bridge, which spans the pool of water in which the core of the new research and test reactor is located, to place fuel elements as directed by Lawrence W. Barrett, Supervisor of the laboratory's experimental physics group. Below, Dr. William Pettus slides holder of fuel element



Nuclear Reaction Chamber.

specimens into pressure vessel of "hot eponential facility." Operated in conjunction with the test reactor, the pressure vessel permits evaluation of the life of nuclear reactor "fuels" under temperature and pressure conditions which duplicate those encountered in an operating reactor. Also built into the wall of the test reactor are other facilities which make it possible to irradiate many types of test specimens, and to conduct beams of neutrons outside for experimental and recording purposes.

Standing on the bridge of a new pool-type research and test nuclear reactor in The Babcock and Wilcox Company's Laboratory, Technician Lester Trout uses a long metal grapple to move a fuel element from its storage vault, which is built into the pool bottom, to the grid plate, which serves as a base for the reactor core. The partly-assembled core rests under water, and may be seen directly beneath the bridge. Long tubes emerging from the core house

control rods and special instruments. Directing the loading is Lawrence W. Barrett (right), Supervisor of the laboratory.

JUST FOR FUN

One lightning bug to another:
"Gimme a push; my battery's dead."

* * *

The trouble is that so many of us are saying, "The trouble is . . ."

* * *

The only ones you should try to get even with are the ones who have helped you.

* * *

Woman fishing: "Have you another cork, dear? This one keeps sinking."

* * *

Boss to job applicant: "The starting salary isn't much, but we can offer you total exemption from office collections for the first year."

* * *

It takes about 1,500 bolts to hold a car together, but only one nut to scatter it all over the landscape.



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MONEY

(Continued from page 13)

The total cost for a student in a private home or apartment will be:

Tuition & Fees	\$ 625
Room & Board	710
Books & Supplies	120
Car Expenses	195
Miscellaneous	255

TOTALS

With Car	\$1905
Without Car	\$1710

The new totals with the tuition increase will be:

With Car	\$2130
Without Car	\$1935

If you are a student who lives at home, your expenses will be the least of all. Naturally, your tuition and fees, and books and supplies will cost the same as in the other cases, but you have gratuitous room and board. Not being subjected to this major expense, certainly your total cost will be considerably less than that of any other student. According to the results of the investigation, you are spending slightly less on your car than a student who lives in a private home or apartment, and are spending the least of all on miscellaneous expenses.

The investigation showed that the total cost for you will be:

Tuition & Fees	\$ 625
Books & Supplies	120
Car Expenses	190
Miscellaneous	205

TOTALS

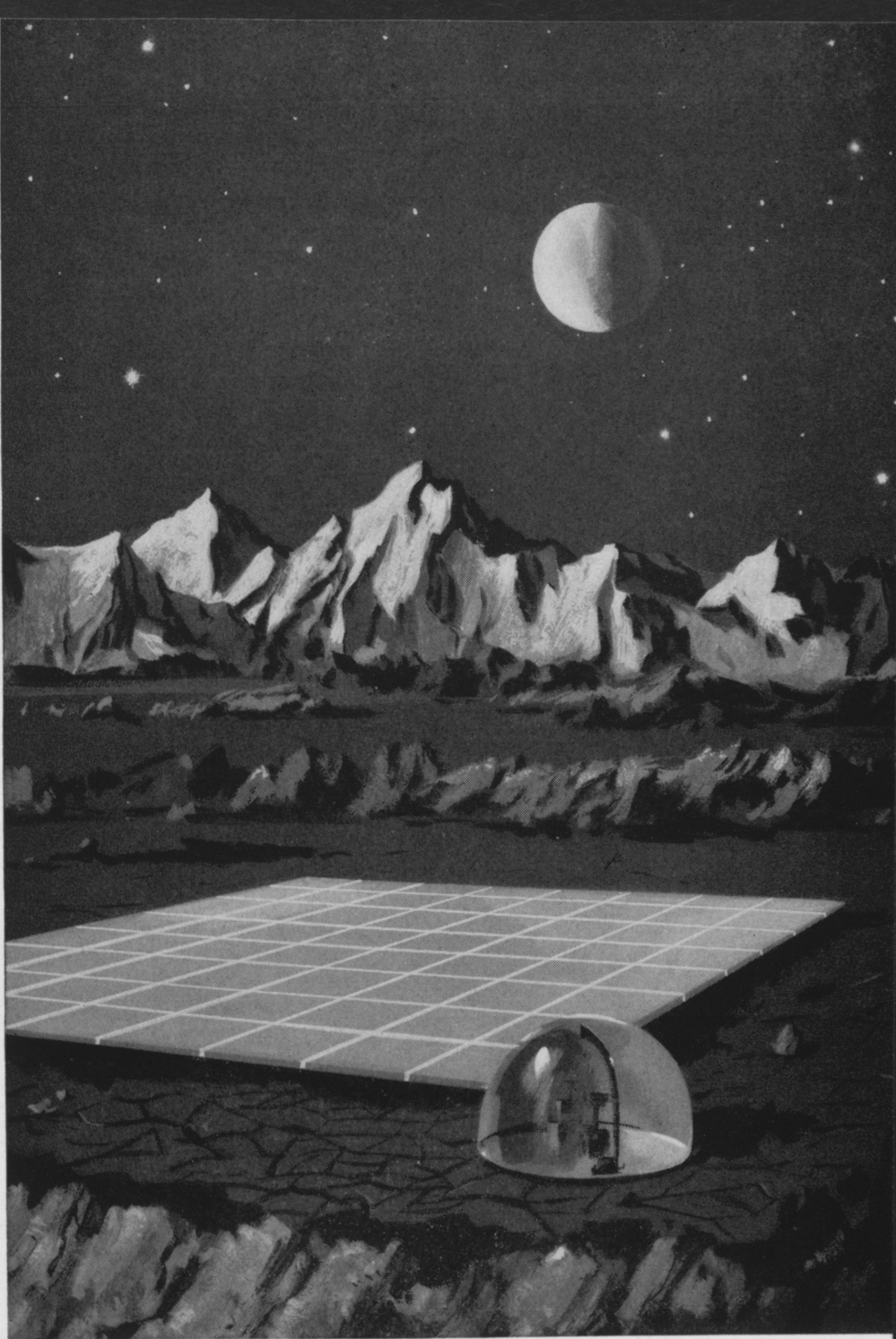
With Car	\$1140
Without Car	\$ 950

Next year, assuming the other factors remain the same, the total cost will be:

With Car	\$1365
Without Car	\$1175

Wherever you are living, your actual total may be higher or lower. The figures presented above are just averages, but they should be a fair representation of a yearly budget.

Where does the money go? Perhaps this article will serve as an answer. When Mom or Dad asks you again, give them this article to read, especially if you are operating at a figure less than that presented here for your respective type of housing.



Westinghouse designs power plant for the moon to provide electricity for man's first space colony

Lunar explorations are no longer the mere dream of a few. Dedicated men all over the world are now actively at work on lunar projects. The first reconnaissance space craft have been launched.

Westinghouse, as part of its effort in the area of space technology, has already designed and demonstrated a practical power plant for use by man's first space colony on the moon. This Westinghouse plant will be very lightweight and compact to facilitate its transport, and it will produce a substantial quantity of electricity from the rays of the sun.

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Brain

Ticklers

1. Each letter represents a different digit in this cryptic addition. What are the numbers?

```

  TWENTY
    FIFTY
    NINE
    ONE
  -----
  EIGHTY
  
```

Anonymous—Confucius maybe.

2. Given a broad, straight river with a constant uniform current. On the shore is a weather station, which on Monday recorded a dead calm, and on Tuesday measured a wind whose direction and speed happened to be identical to that of the river current. On which of these days, if either, could a sailboat have

been sailed more quickly a given distance downstream?

3. The following is the standing in a college baseball league after each team had played one game against each of the other.

Team	Won	Lost
Disgustingly Normal	8	0
East Snowshow	7	1
Bowdiddly Tech	6	2
Fastbuck Business Col.	5	3
Whynot U.	4	4
Up State	3	5
Down State	2	6
Farther Down State	1	7
Carviewell Medical	0	8

Who won the Fastbuck-Up State game and why?

4. "If the puzzle you solved before you solved the puzzle you solved after you solved the puzzle you solved before you solved this one, was harder than the puzzle you solved after you solved the puzzle you solved before you solved this one, was the puzzle you solved before you solved this one harder than this one?"

5. Here are a couple of teasers that require a little mathematics and logic. Do not fear. The only math requirement is advanced arithmetic.

Hans, Reinzi, Egbert, and Pedro are going fare-hunting tomorrow, on a boulevard that runs directly North and South, with no traffic lights. They estimate that equal numbers of pedestrians walk in each direction, at an average of four miles an hour.

Hans says: "You're all crazy to use up gas cruising around all the time. I'm going to park beside the curb until a fare comes along."

Reinzi says: "I'm going to cruise up and down at four miles an hour, and I'll have twice your chance of picking up a fare."

Answers to last month's problems.

1. Lorna is Col. Downing's daughter

2. 246

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ALUMNI NEWS

(Continued from page 26)

Power Station. The project involves a great deal of underground construction, the building of a 300 foot high underground surge chamber.

Mr. Miller spoke very highly of the Australian people although he and Mrs. Miller have had some trouble with the customs and language differences. He also commented on the fact that the engineers in Australia are so well trained.

'52 Harry R. Harrison is now in Iwakoni, Japan. He is a Group Chief with Western Electric's Field Engineering Force, and he is currently on loan to Bell Telephone Laboratories. It is interesting to note that since his graduation six years ago, he has spent four of those six years out of this country, either in Cuba, Europe, or Japan.

'56 Robert N. Young has been transferred to Pennsylvania. He is employed as a Field Engineer by the Mission Mfg. Co., and is now working in the Development Engineering Department.

LIBRARY NOTES

(Continued from page 30)

employed in reports by men of eminent engineering stature down through the ages.

Sypherd, Wilbur Owen. *Manual of Technical Writing*.

The concern of every chapter of this book is the application of the general principles of good expository writing to the writing problems of the technical man.

Ulman, Joseph N. *Technical Reporting*.

Addressed primarily to students and practitioners of engineering and the sciences who have reached the point at which they have reporting jobs to do and have something to say.

Waldo, Willis H. *Better Report Writing*.

This guide presents authoritative facts on the important details of effective scientific composition, style, division of reports, tables, illustrations and use of words. The book is written as a quick reference instead of a classical exposition of technical English.

FEBRUARY, 1959



Westinghouse is the best place for talented engineers

The preceding four advertisements have only touched upon Westinghouse activities related to space. Some of the other projects in this area include the investigation of electronic and mechanical phenomena in high vacuums, work with special metals, and the development of various devices for satellite reconnaissance purposes. There are also a number of highly-classified projects.

The wide variety of engineering and scientific work at Westinghouse demands the services of really talented engineers. This *diversity of opportunity* is one of the biggest reasons why so many outstanding engineers have chosen Westinghouse over the years, and the variety of work being done today is greater than it has ever been before. Guided missile controls, atomic power, automation, radar, semi-conductors, and large power equipment are only a few of the other fascinating career fields to be found at Westinghouse.

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A glossary is provided at the end of the report to explain all the engineering terms marked with an asterisk.

"Well, here we are again."
"Yah."
"I wonder what kind of an orgy we perform this week?"
"Beats me."
"Anyone read the experiment yet?"
"No."
"Not me."
"I did."
"Damn you, Taylor. You know the rules of our club. Nobody reads the experiment until fifteen minutes after the period starts."
"I must have been out of my mind."
"Jim, hit Taylor full flush on the mouth with your slide rule*."
"Good grief. I should say that hurt plenty."
"That'll learn yah."
"I guess we might as well get the show on the road."
"Forsooth."
"It says here, 'From your knowledge of the oscilloscope* gained in previous experiments, connect the scope into the circuit shown, so the voltage fluctuation across the unilateral filibuster* may be observed.'"
"Which one of you sluggards have some oscilloscope knowledge?"
"Not me."
"I pass."
"Belch."
"Ain't none of you guys got no smart? How do you turn the scope on?"
"Beats me."
"I pass."
"Belch."

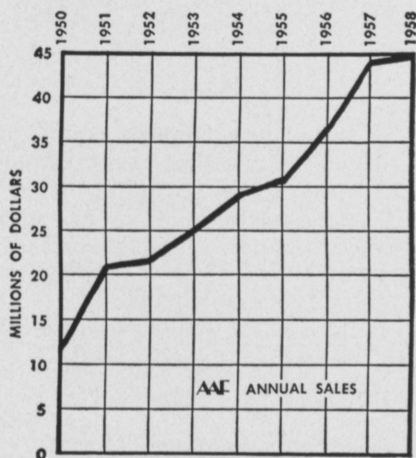
"Taylor, go ask the instructor how to turn this animal on."
"Why should I always be the work horse in this outfit?"
"Slap his young face, Jim."
"Okay. I'll go."
"What did the instructor tell you?"
"He slapped my face."
"This must be the switch. Yah, it's on now."
"What's a unilateral filibuster?"
"Beats me."
"I'm snowed."
"Belch."
"This must be it."
"That's my cigarette."
"Oh. Must be this black thing here. Taylor, go ask the instructor what a filibuster looks like."
"When I was over there the first time he was asking one of the guys if they knew what it looked like."
"Well, we can hook this black thing into the circuit and see what happens."
"It says here, 'Plot the suicidal source current as a function of time measured in hours.'"
"That's sinusoidal, you idiot."
"What does sinusoidal mean?"
"I don't know."
"Where do we put the ammeter* in the circuit to measure source current?"
"Across the source, I guess."
"What happened?"
"The needle went around three times and disappeared."
"Try a bigger meter."
"That needle just went around twice and melted."
"They don't make those meters like the used to. I guess we'll have to fudge that into the report."
"Hey, Gary?"
"What?"
"You learning anything?"
"No."

"It says here, 'Plot the smoke coming from the filibuster as a function of time measured in microseconds.'"
"Is it smoking yet?"
"No."
"Hold your lighter under it."
"It's still not smoking."
"We'll have to fudge that into the report."
"So be it."
"Gasp."
"What are you gasping about, Taylor?"
"I grabbed hold of a hot wire and I couldn't let go for five minutes."
"You young fool. Hit him again, Jim."
"Damn you, Jim. You knocked out out my whistling tooth."
"Remember that experiment we did last week?"
"No."
"Me either."
"Can't say that I do."
"Well, anyway, the curve I plotted had a shape just like my girl's figure."
"My curve came out a circle."
"Mine was square."
"I plotted one that looked like a rip saw blade."
"That's what happens when we don't decide what kind of curve we're going to plot before we write up the reports."
"Hey, Gary."
"Yah."
"You learning anything?"
"No."
"It says here, 'Plot the color of the filibuster as a function of time measured in days.'"
"I guess we can fudge that into the report."
"Who writes these experiments?"

(Continued on Page 40)

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**American Air Filter
Company, Inc.**

Louisville, Kentucky



MILITARY BALL CANDIDATES

(Continued from Page 18)

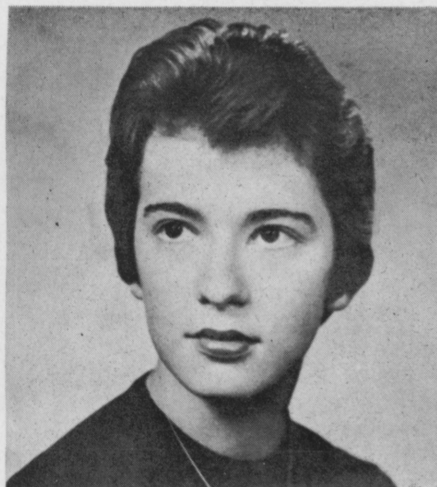
JACKYE MURPHY

Jackye Murphy is D company's nomination for Ball Queen. She attended Indiana University for one year. She is now attending the Indiana University Medical Center in Indianapolis, where she is a recently capped sophomore. She graduated from Winimac High School in Winimac, Indiana. Her main outside interest is music, and she is a member of the Medical Center Chorus. She also enjoys swimming, boating, ice skating, and almost any other sport. She was nominated by Larry Berger.



JUDY DUKES

The Band has put forth Judy Dukes as their nomination for Ball Queen. She was originally nominated by Bill Volkers. She is a Terre Haute girl, graduated from Wiley High School. She is a freshman at Indiana State Teachers College and is on the Distinguished Honor Roll. She is vice-president of her pledge class in Delta Gamma Sorority. Miss Dukes is a voice major. She has sung with several dance bands and likes Four Freshman records. She has two peevish which are colds and people who do not speak.



The farmer had been to the big city on business for a couple of weeks. Getting off the train on his return home, he happened to run into his hired hand.

"Hi Zeb! What's new?"

"Not much."

"That's fine, boy did I . . ."

"Ceptin' we buried your dog."

"You buried my dog? Why?"

"S died."

"I figured it was if you buried it. How'd it die?"

"Hoss kicked it."

"Why'd the horse kick it?"

"Spark fell on it."

"Spark? Where did the spark come from?"

"From the barn."

"From the barn? What happened to the barn?"

"Burned down."

"How'd the barn catch fire?"

"S'pose it was sparks from the house."

"You mean the house burned

down, too?"

"Yep!"

"How'd that start?"

"Figure the candles caught the drapes."

"Candles? What candles?"

"The ones around your wife's coffin."

* * * * *

A freshman engineer is a young man who knows why a strapless gown is held up, but doesn't yet know how.

* * * * *

During World War II, there was this whale, see. Now this whale musta been near-sighted as a bat . . . because he upped and fell in love with a U.S. Submarine.

He was so much in love that it hurt. He followed this sub all over the world, see . . . and every time it ejected a torpedo this love-sick whale would pass out cigars.

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E.E. LAB—

(Continued from Page 38)

"I heard they hired a guy from Bus. Ad."

"No. They get them out of science fiction magazines."

"I heard when the wheels get together for meetings, the things that come up for discussion they can't find an answer to, they make a lab experiment on."

"Ex post facto."

"Taylor, what in the hell are you up to?"

"I'm putting things away. Are not we done?"

"Get him, Jim."

"Damn you, Jim. You got me on the nose that time."

"It says here, 'Name twenty practical, everyday uses you can think of for the filibuster.'"

"They must have bought a bunch of them from a starving professor and now they don't know what to do with them."

"I know what they can do with them."

"Plot that as a function of time."

"This meter must be war surplus."

"How do you know that?"

"It's marked here, property of the Union Army."

"Well, what the hell do you know about that?"

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

"I thought you were."

"I thought he was."

"We don't have any data yet."

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

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

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

"Yah. That one always works out pretty good."

"Sort of hard to make up data for that one."

"Let's use a straight line this time."

"Okay. We can use the other one next week."

"Sounds good to me."

"Good enough."

"Belch."

My God. I've been shot."

"What happened to Taylor?"

"He fainted. He said someone shot him."

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

"That's a pretty good joke, Jim,

I'll have to remember it."

"You got a good head on you, Jim."

"Where am I?"

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

"Our fuse* just burned out again."

"They don't make those fuses like they used to. Short a wire across it."

"What do you think was on there before?"

"It says here, 'Derive equations to fit each curve that you will plot, et cetera, ad nauseam.'"

"I think we can find a couple formulas written on the walls in the men's head downstairs that should fit into the report."

"Yah, there should be a couple there we can fudge in."

"Hey, Gary."

"Yah."

"You learned anything?"

"Yah. I just learned that I'm going to transfer to general college."

"Hand me that wire."

"This one?"

"Yah."

"Wow."

"You get a shock?"

"I saw my whole life flash by me."

"That must be the hot side of the circuit then. We have to show in the report which side of the circuit is hot."

"Eureka."

"What's up?"

"I found a microphone someone forgot in the oscilloscope."

"You got a pair of pliers?"

"I could use this mike with my ham set."

Snip.

Editor's note: The four students involved in this recorded conversation were stripped of their epaulets and brass buttons, had their slide rules broken in half over the dean's knee, and were drummed out of the corps.

GLOSSARY:

Ammeter . . . A meter used to measure the amms flowing in a circuit.

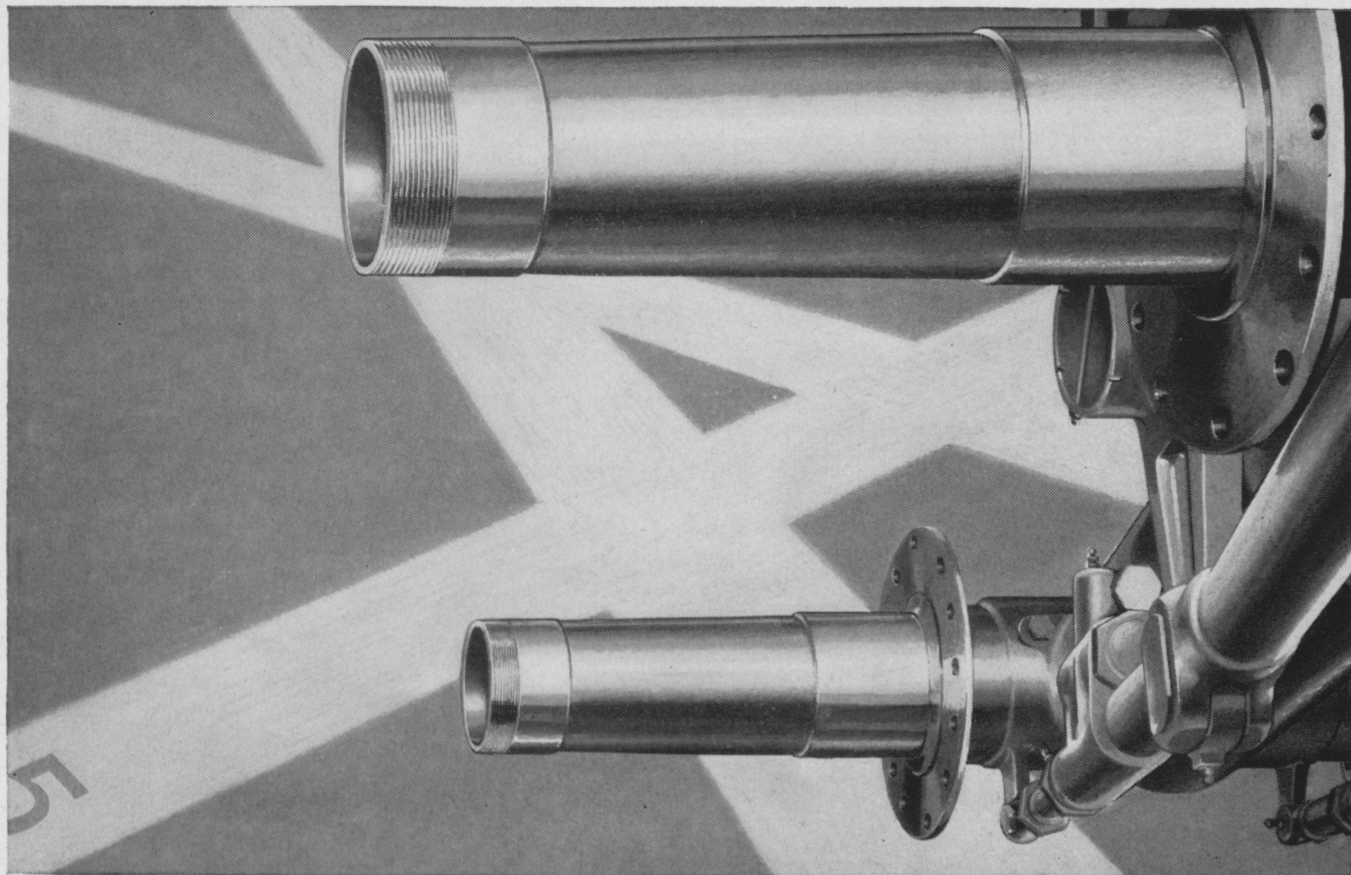
Capacitor . . . Replacement for the condenser.

Fuse . . . Common replacement for the copper penny.

Oscilloscope . . . Single channel television.

Slide rule . . . slip stick.

Unilateral filibuster . . . You name it.

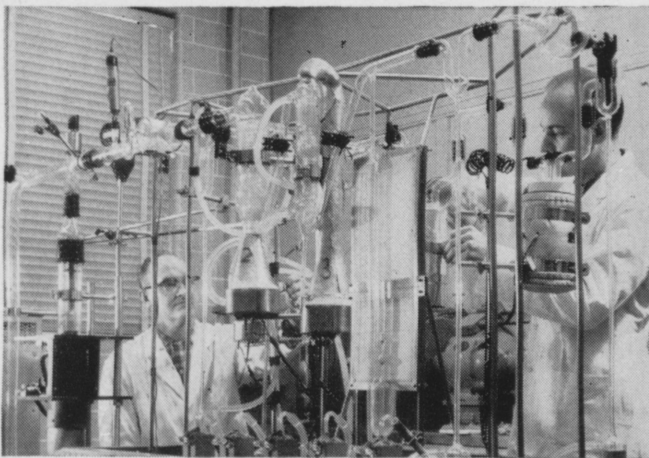


How to get steel tough enough to land America's first jet airliner

YOU see above the axles of the Boeing 707—America's first jet airliner. They have to be tough. A cross-wind landing could put the whole landing impact of this 122-ton plane on one wheel—instead of eight. And these axles have to be light. Manufacturers of the 707's landing gear had built landing gears for dozens of other models using an analysis of seamless steel tubing specially developed by the Timken Company. But to be strong enough for the much heavier 707, the steel would have to be cleaner. Any impurities in the finished part would cause its rejection. Timken Company metallurgists said the steel *could* be made clean enough for the 707. And it was—met highest specifications, stood up to the terrific landing impacts.

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ADVERTISING INDEX

1. ALCOA	1
2. Allis Chalmers Mfg. Co.	23
3. Allison Div. of G.M.	19
4. Amer. Air Filter Co.	39
5. A. W. Faber	32
6. Blossom Shop	42
7. Collins Radio	6
8. Dutch Wash	42
9. Eastman Kodak	Cover
10. E. I. DuPont	7
11. Garrett Corp.	21
12. General Electric	Cover
13. General Motors	2
14. Heinel's Flower Shop	36
15. Hunter-Gillum-Hunter	42
16. Indianapolis Brickcrete	24
17. Koppers Co.	5
18. One Hour Martinizing	36
19. Parkmore Restaurant	42
20. Pepsi-Cola Bottling Co.	36
21. Pratt & Whitney	22
22. Rose Bookstore	40
23. Rose Polytechnic Institute	8
24. Standard Oil of Indiana	3
25. Timken Roller Bearing Co.	41
26. Union Carbide	27
27. Westinghouse Corp.	29
28. Western Electric	25
29. Woodridge Motel	34

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.

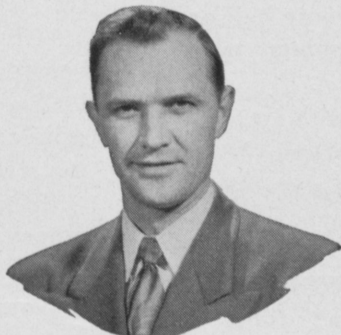


Electronics man, William E. Martin, Alabama Polytechnic Institute, BSEE '53, engineers applications of induction heaters.

plus wide choice of type and fields of



Design of generators for steam turbines is directed by G. W. Staats, 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

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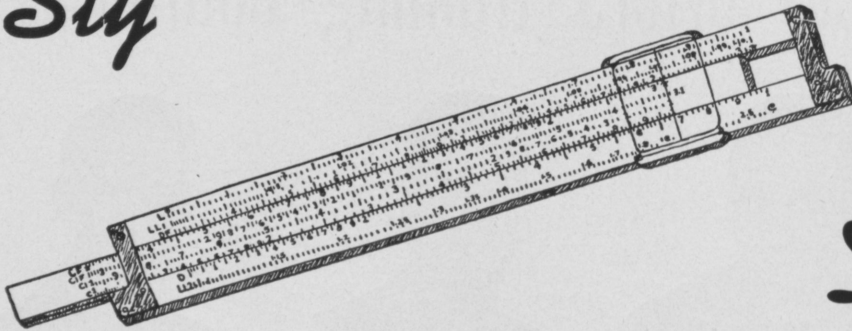
Even though you may not know exactly what you wish to do, the Allis-Chalmers training course is designed to help you find the type of work and the field to which you are best suited.

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Sly



Droolings

Stolen by Dick Kirby, sr., m.e.

People are like steamboats—
they toot loudest when they are
in a fog.

* * * * *

Skidding is the action.
When friction is a fraction
Of the vertical reaction
Which won't result in traction.

* * * * *

SEX AND THE ROSE ENGINEER

two worlds apart, far far apart
two spheres which never merge
Sex and the Rose Engineer
are scopes which cannot converge
the first stays in w.r. ha.

flashing eyes and swaying hips
the fishbowl sees them all
tight-fitting sweaters and red,
red lips

the second lives beneath the arch
his slide rule by his side
and daily off to bluebooks march
to live unloved until he died
a million miles is the diag's length
and the hill is further still
when homework assignments sap
his strength

and finals break his will
two worlds apart, far far apart
two spheres which never merge
Sex and the Rose Engineer
are scopes which cannot converge

* * * * *

The dam burst, and the raging
flood quickly forced the town people
to flee to the hills.

As they gazed down sadly at
their flooded homes they saw a
straw hat float gently downstream
for about fifty feet. Then it stopped,
turned around and plowed

slowly upstream against the rushing
waters. After fifty feet, it
turned and moved downstream
again. Then upstream again. "Say,"
said one of the townfolk, "What
makes that hat act so funny?"

"Well, I ain't sartin sure," spoke
up a youth, "But last night I heard
Grandpa swear—come hell or high
water he was gonna mow the
lawn today."

* * * * *

The stone age is from 16 to 60—
and the larger the stone the better
she likes it

* * * * *

FAMOUS LAST WORDS:

"Hell, they don't flunk graduating
seniors!"

* * * * *

The more I think about going
out and getting a job the more I
think about staying on for a Master's.

* * * * *

IT'S THE TRUTH

Some girls go in for necking—
others go out for it.

Many of the girls you see at
college are at the age where their
voices are changing—from no to
yes.

One thing a girl learns in college
is how to refuse a kiss—without
being deprived of it.

Being a man is difficult—if only
for the reason that we must deal
with women.

The hardest thing for a man to
remember are the girls he told he
would never forget.

A woman looks upon a secret in

one of two ways. Either it is not
worth keeping, or it is too good
to be kept.

* * * * *

"Give me a double shot, quick,
before the trouble starts!"

The bartender did and he drank
it.

"Give me another double shot
before the trouble starts!"

The bartender did, and being
puzzled, asked, "Before what trouble
starts?"

"It's started now, I haven't any
money."

* * * * *

Now I lay me down to sleep, the
lecture's dry, the subject's deep;
if he should quit before I wake,
someone kick me for goodness
sake!

* * * * *

Harry was playing his usual 18
holes of golf Saturday afternoon.
He had just sliced into the rough
off the 17th tee and was about to
ship out when he noticed a long
funeral procession going by on an
adjacent street. Harry removed his
cap and stood still until the funeral
passed. Later at the club house,
a fellow golfer greeted Harry.

"Say, that was a nice gesture
you made today, Harry."

"What do you mean?"

"I mean it was nice of you to take
off your cap and stand respectfully
when that funeral passed," his
friend explained.

"Oh, yes," said Harry, "We
would have been married twenty-
six years next month."



In the Arma Visual Computer, a single control selects the desired chart from as many as 700 photo slides. Each slide contains punched code holes which automatically tune in the corresponding Omni Bearing Distance station. The image of the plane is governed by a combination of the radio signals and the plane's gyro instruments.



Photography teams with electronics and adds new certainty to flight

Now a visual computer pictures a plane's precise position and heading on projected photos of aeronautical maps.

Arma Division, American Bosch Arma Corp., working with the Air Navigation Development Board and C.A.A., has developed a valuable new aid in air navigation using photography.

With it the pilot, high above the weather, flicks a switch and before him appears a map of the area he's over. On the screen a tiny shadow of a plane moves and shows exactly where he is, where he's heading and whether he's on course.

This spells added certainty. Even more! It can mean savings in time and money, too. For the flight can proceed by plan rather than by dog-legs on the beams.

So again we see photography at work helping to improve operations—doing it for commercial aviation just as it does for manufacturing and distribution.

Photography works in many ways for all kinds of business, large and small. It is saving time, saving money, bettering methods.

.....

CAREERS WITH KODAK

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.....

Eastman Kodak Company, Rochester 4, N. Y.

General Electric interviews
Dr. Richard Folsom, President of
Rensselaer Polytechnic Institute,
to explore . . .

Teaching— A Career Opportunity For the Engineer



Leading educators, statesmen and industrialists throughout the country are greatly concerned with the current shortage of high-caliber graduates who are seriously considering a career in the field of science or engineering education. Consequently, General Electric has taken this opportunity to explore, with one of America's eminent educators, the opportunities and rewards teaching offers the scientific or engineering student.

Q. Is there in fact a current and continuing need for educators in technical colleges and universities?

A. Colleges and universities providing scientific and engineering educational opportunities are hard pressed at the present moment to obtain the services of a sufficient number of well-qualified teachers to adequately carry out their programs. Projected statistical studies show that this critical need could extend over the next 15 or 20 years.

Q. Why is this need not being met?

A. There are probably three main reasons. These might be classed under conditions of financial return, prestige associated with the position, and lack of knowledge and understanding on the part of the college student of the advantages and rewards teaching as a career can afford.

Q. What steps have been taken to make education a more attractive field to engineering students?

A. Steps are being taken in all areas. For example, we have seen a great deal in the newspapers relating educators' salaries to the importance of the job they are doing. Indications are that these efforts are beginning to bear fruit. Greater professional stature is being achieved as the general public understands that the youth of our nation is the most valuable natural resource that we possess . . . and that those associated with the education of this youth have

one of the most important assignments in our country today.

Q. Aside from salary, what rewards can a career in education offer as opposed to careers in government or industry?

A. The principal rewards might be freedom to pursue your own ideas within the general framework of the school, in teaching, research and consulting activities. As colleges and universities are normally organized, a man has three months in the summer time to engage in activities of his own choice. In addition, the educator is in direct contact with students and he has the satisfaction of seeing these students develop under his direction . . . to see them take important positions in local and national affairs.

Q. What preparation should an engineering student undertake for a teaching career?

A. In college, the engineering student should obtain a basic understanding of science, engineering science, humanities and social sciences with some applications in one or more professional engineering areas. He should have frequent career discussions with faculty members and his dean. During graduate work, a desirable activity, the student should have an opportunity to do some teaching.

Q. Must an engineering student obtain advanced degrees before he can teach?

A. It is not absolutely necessary. On the other hand, without advanced degrees, advancement in the academic world would be extremely difficult.

Q. How valuable do you feel industrial experience is to an engineering or scientific educator?

A. Industrial experience for a science

educator is desirable; however, with a senior engineering educator, industrial experience is a "must". An ideal engineering educator should have had enough industrial experience so that he understands the problems and responsibilities in carrying a project from its formative stages to successful completion, including not only the technical aspects, but the economic and personal relationships also.

Q. What do you consider to be the optimum method by which an educator can obtain industrial experience?

A. There are many methods. After completion of graduate school, perhaps the most beneficial is a limited but intensive work period in industry. Consulting during an academic year or summer is a helpful activity and is desirable for older members of the staff. Younger educators usually need experience in "living with the job" rather than providing consultant's advice to the responsible individual.

Q. Based on your experience, what personal characteristics are possessed by successful professors?

A. Primarily, successful professors have an excellent and growing knowledge of their subjects, are interested in people, and transmit enthusiasm. They have an ability to explain and impart information with ease. They generate ideas and carry them out because they are devoted to developing their fields of knowledge. They desire personal freedom and action.

For further information on challenging career opportunities in the field of science and engineering education, write to: Mr. W. Leighton Collins, Secretary, American Society for Engineering Education, University of Illinois, Urbana, Ill.

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