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In This Issue

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James Reeder joined Westinghouse in 1955—now working on jet aircraft power systems

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Most important, Jim Reeder is doing exactly what he wants to be doing. Upon completion of the Westinghouse Student Training Course, he was assigned to the Aircraft Equipment Department in Lima, Ohio. He has submitted 12 patent disclosures (which have resulted in awards totaling more than $800.00); and he has four U.S. patents pending. Active in the AIEE, he has completed more than half the work required for his MSEE at the University of Pittsburgh through the Westinghouse Graduate Study Program.

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Want to know about YOUR opportunities on the Allison Engineering Team? Write Mr. R. C. Smith, College Relations, Personnel Dept.
Letters to the Editors

The title above is one which the editors of the Technic hope will become incorporated into each and every future issue of the Technic. It will be an opportunity for the interested students of Rose to express their opinions on any matter pertaining to school policy, faculty, and the actions of other students.

These letters, to benefit Rose, should not only criticize where criticism is due, but they should also offer praise where praise is due. In this way, many of the unpleasantries of Rose can be brought out in the open and perhaps eliminated. Also, the better aspects can be emphasized and improved upon, thus making Rose a school of which we can be even more proud.

To submit a letter, simply address it to the Rose Technic and drop it in the campus mailbox. All letters must be signed. However, they will be printed anonymously upon request. Any letter submitted on a legitimate topic will be printed.

The editors would like to invite both student and faculty participation in this feature. The editors would also appreciate alumni participation.

Please submit your letters now, so they may be edited and placed in next month’s issue.

Thank you,

R.L.S. & R.L.B.
Outstanding performers never go unnoticed

If you have real ability, the coach or team manager will recognize it because they are constantly on the lookout for potential star performers.

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

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

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

Looking Ahead

The present student at Rose seems very prone to complain about everything that goes on here at Rose. Many students fail to appreciate the many benefits we derive from being Rose men.

The school has many problems stemming from its size. One of these is keeping qualified instructors. Because of the small size of the school and the fact that Rose has almost no research facilities, or graduate work offered, it becomes very difficult for Rose to attract men away from industry and the larger schools. However, the school is doing its best to correct this situation by providing fellowships to send young instructors to graduate schools during a leave of absence.

Students do not even take advantage of the instructors we now have. Admittedly, some of the instructors are good, and some are not so good. The student body could help the instructors by simply going into their offices and talking to them. Nearly all of the instructors would welcome constructive criticism.

The complaining attitude of the upper classmen has spread rapidly. It is especially noticeable in the freshman class. If more of the upper-class men would try to help to encourage the freshman, instead of telling them, “Well, you have it easy now; it really gets rough later on,” they would have more confidence in their ability to work and get through Rose.

As we all know, the school has worked out a new curriculum. It seems quite feasible to suppose that it isn’t perfect yet. Therefore, the freshmen are going to need all the help and faculty understanding they can get. Other students can help them out some, but they must also help themselves. They could greatly benefit themselves by getting to know their professors, and thereby getting to know their most important source of assistance.

If Rose students will begin thinking positively, the overall spirit of the school will increase, and men will graduate from Rose happier and wiser, rather than complaining and soured on everything in general.

R. L. B.
By the time this issue of the Technic reaches you, spring will be very near. This is the usual time when the young man’s fancy tends to turn more to outside life than indoor studying. I accept the fact that spring rejuvenates everyone’s spirits after a cold, bleak winter; however, as in every walk of life, our change in pitch has to be checked to some extent. Having lived in the dormitory last year, I know that the budding of spring brings with it the budding of many more practical jokes on roommates and friends and extra time spent in other extra-curricular activities not pertaining to school. All in all, I mean to infer that less and less time seems to be spent for studying by many students that actually can’t afford the time. This is the time of test for each Rose man’s ability to restrain himself to his personal and family obligations. May each student resolve to make of himself a man by fixing a pattern of conduct and activities to check against harming himself grade-wise.

However, there is just one small challenge to this resolution; we have to abide by “all” the restrictions contained in it or it is of no use at all. Many students seem to fail to realize the financial problem that they are imposing on their families to be able to attend this school. When we stop to think what bearing our four years of effort at Rose will have on our future, I am sure our time is found to be very valuable.

MRS. CLAIR BISHOP

Mrs. Clair Bishop, a world traveler and speaker on art and cultivation, delivered an interesting talk in the February 5 convocation on the topic of “Shall We Be Educated Or Cultivated.” Mrs. Bishop gave many of her opinions on the direct association of education and cultivation that were very worthy of consideration. For the interest of the group present, she stressed the importance of cultivation in association with the sciences. It was pointed out that the scientists and engineers hold the destiny of the world, and that they should by all means be cultivated. With this in mind, the importance of the correlation of the liberal arts and humanities with science can readily be seen. Those students working toward graduation with only material aims in view eventually are confronted with the feeling of emptiness. Mrs. Bishop advanced that credits are not an end in themselves but merely preparation for learning the “art of living a cultured life.” A degree of humor was added to the whole convocation by her catchy European dialect.

EARTH SATELLITES

CONVOCATION

Dr. Harry E. Crull, head of the Mathematics Department at Butler University and director of E.I. Holcomb Observatory outlined some of the major problems in launching earth satellites in a convocation sponsored by the Math Club February 19. The first problem noted was the ratio of launch pad weight to pay load weight for present satellites. Dr. Crull stated that with the scientific advancement of today it still takes eleven tons of rocket sitting on the launch pad to put twenty pounds of pay load into orbit. With this ratio, it might be interesting to think of what resources and ability the Russians had to have to launch their satellite weighing thirty-six hundred pounds. What I thought was the most intriguing problem was that difficulty in navigating from one planet to another. An example is the flight from earth to Mars and back with the least difficulty.

Due to the differences in the orbits of the two planets, they are constantly changing directions and positions relative to each other. When the two planets are the shortest distance apart in their different orbits, it would take a space ship of today two hundred and seventy-two earth days to fly the distance. However, if a navigator was to wait until they were closest together and set a course directly on Mars, upon flying that distance he would find
himself several hundred thousand miles off destination. This leads to a calculation of the proper "lead" on Mars in directing a course. If a course is set so that the ship reaches this position, the problem is solved for the exception of one small factor. The navigator has only to wait five hundred days to set a similar course back to earth.

Dr. Crull kept his audience very attentive by adding the lighter side of the discussion at the proper times.

SCHOOL SPIRIT

Rose has always been a school of many time-honored traditions. Many of these traditions, such as the senior bench, the upper-classmen walk, the taking parties, clean shaven faces, and the wearing of corduroy clothing, seemingly are becoming unheeded. These traditions were established by the men before us who could foresee their benefits by their experiences, and felt that they merited respect.

The freshmen soon after coming to Rose get the feeling that they are being harassed to a considerable degree by the sophomores. Being a sophomore, I would agree to this. As a freshman I failed to realize the real reasoning behind the various ideas. This mild harassment actually has a definite motive behind it. The main function is to organize the freshmen class for some combined and group effort. Secondly, it teaches the freshmen respect for the upper-classmen. After one has been at Rose for awhile, he realizes the will power and determination that it requires to maintain a favorable record. In later years, demands will be made of us to acknowledge some rights and privileges of others that are denied us due to seniority; college is an excellent place to acquire this trait.

Having spoken to several juniors and seniors this last week, I have found that they are very disappointed in the attitude and respect towards such organizations as Blue Key and Tau Beta Pi. The men that have been accepted by these organizations have put in a lot of extra work besides their school obligations. I feel that these men who sacrifice certain things and go out of their way to help the school are worthy of extra respect. Likewise, the men who constitute our sports teams and uphold the name of the school in this manner are due their respect. All who can't participate in such activities should at least give these people their support so that they won't feel that all was in vain.
HONEYCOMB STRUCTURES

By all the laws of aerodynamics, the bumblebee is unable to fly. But the bumblebee, being ignorant of these laws, flies anyhow. And now man, in his aerodynamic development, has returned to the bee for a second lesson—the honeycomb.

Basically honeycomb sandwich material consists of a core of some kind of material formed in honeycomb pattern securely sandwiched between two sheet facings.

The properties of the honeycomb are, of course, dependent upon the materials used in its construction; nevertheless, honeycomb sandwich material usually exhibits an extraordinarily high strength-to-weight ratio, excellent stiffness, good thermal and acoustical insulation properties, and excellent fatigue resistance.

DEVELOPMENT OF HONEYCOMB

If we disregard the bee, honeycomb sandwich material is a relatively new structural form. In fact, not until late in World War II was honeycomb sandwich structure used to any extent. Only today are the full potentialities of honeycomb sandwich material being realized and investigated.

The earliest sandwich construction dates back to the introduction of the corrugated paper carton in 1875. However, there was no extensive structural use of sandwich materials until the development of synthetic resin adhesives capable of bonding the core materials to the facings.

The British de Havilland Mosquito bomber of World War II was the first aircraft to use sandwich construction extensively; this sandwich was made with birch plywood-type facings and a balsa core. Later, a sandwich material called Metallite, which consisted of high-strength aluminum alloy facings bonded to a balsa core, was developed by Chance-Vought Aircraft, Inc. and used on several naval aircraft. These cores were all solid and were not completely satisfactory. Warping often occurred because of differential expansion, and additional weight reduction of the sandwich was desired.

A core made of a material formed into an expanded or cellular network was the answer. A cross-section of such a core looked like a beehive comb, and hence this core became known as honeycomb. The Glenn L. Martin Company pioneered the development of honeycomb sandwich material, and in the past fifteen years the idea has widely appeared.

As early as 1951 one magazine prematurely stated that honeycomb had come of age. At that time honeycomb construction was almost entirely limited to use by the military. Since cost was a minor consideration in military applications, most honeycomb used an aluminum core instead of the more economical paper, glass cloth, or cotton cores. The aluminum-core honeycomb was used in military aircraft for wing panels, flooring, fuel cell liners, control surfaces, and bomb bay doors.

An outstanding early application of honeycomb using a paper core was the Chrysler Corporation factory in Indianapolis, completed in the summer of 1951. The walls of the factory are made up of 60,000 square feet of aluminum-faced paper honeycomb sandwich panels, made by the Cycleweld Division of Chrysler Corporation.

By 1953 honeycomb was growing faster than ever before. New types of cores were being used, including stainless steel, and new uses for honeycomb were being developed. Sandwich materials had been developed for use at temperatures up to 1000° F.

In the past several years honeycomb sandwich material has been used increasingly for construction of
SANDWICH

By Bill Perkins, jr., c.e.

all types. Builders and manufacturers are entering a “honeycomb holiday” where the honeycomb sandwich, because of its versatility and comparatively high strength and low cost, will be used where a high strength-weight ratio is necessary or desirable.

HONEYCOMB DESIGN

The honeycomb sandwich structure consists of two facings, usually of similar material to eliminate distortion, bonded to both sides of the honeycomb core with a structural adhesive. The materials and geometrical layout for each job must be selected to best satisfy the engineering, manufacturing, and service needs. Cost is always a factor in design.

First the proper core material must be chosen. This material must stabilize the facings and resist compression and tension perpendicular to the faces; it must prevent buckling and maintain the panel in a fixed position. Balsa wood is used: it has high uniform compressive and tensile strength, good bonding characteristics, and is light in weight. Foamed plastic, which is foamed in place between the preformed sheets, possesses a good bending modulus and high compressive strength but often is too heavy a material. Paper honeycomb is used where light strength is required. It is light in weight, has good insulating values, is low in cost, and when impregnated with resin is fungus and moisture-proof. Where strength requirements are not high, cotton cloth honeycomb is available. Cotton honeycomb has fair compressive strength and moderate moisture resistance. Glass-reinforced plastic honeycomb has little moisture absorption and excellent dielectric properties; thus it is applicable for radar antenna housings. Stainless steel honeycomb, a very expensive core material, is used where strength and thermal requirements are extremely high. Aluminum honeycomb is a very versatile core which is highly resistant to temperature extremes, moisture, corrosion, and fungus.

Two methods have been evolved for the manufacture of honeycomb core: the full-open and the compressed method. In the full-open method, the ribbons of foil are corrugated or otherwise formed immediately to the core shape; then the ribbon elements are assembled and glued, welded, or brazed. The compressed core, called “hobe” (honeycomb before expansion), is made on completely automatic machinery and is expanded as it is needed.

The full-open method is also referred to as the corrugated method and the compressed method is often called the expansion method. Generally the full-open method is used to make cotton, fiberglass, aluminum, and stainless steel cores, and the expansion method is used to make paper honeycomb.

Facing materials may be used in any combination, but since they carry the major load, they must be chosen with care. Among various facing materials used are laminated paper, cotton cloth, glass-reinforced plastic, galvanized sheet, stainless steel, magnesium, and aluminum. Characteristics of the facing will determine the stiffness, configuration, stability, and the strength of the member. Resistance to impact is also dependent on the facing material and not on the panel thickness. The stiffer the face material the more it spreads the impact force over the core, and thus the larger the force which can be absorbed without damage.

Just as the chain is no stronger than its weakest link, so is the honeycomb sandwich structure no stronger than the bond between the core and the facings. The adhesives most commonly used, most of which have been developed only recently, are polyvinyl butyral phenolic, phenolic, epoxy, polysulfide elastomer modified epoxy, and di-isocyanate. These adhesives are applied and bonded in various ways. For high-temperature honeycomb (which uses a metal core), brazing or welding is commonly used. The bonding method, just as the core and facing materials, must be chosen to do the required job at the permitted cost.

In considering the relative sizes and weights of the facings and cores, A. J. Douglas states: “Past performance has proven that for optimum

(Continued on page 26)
After a week layoff for finals the Rose team played host to Vincennes. The Engineers were out to avenge an earlier defeat on the visitors home court.

The finals showed their affect from the first tip-off as the Rose five was sluggish the whole game. The visitors led at the intermission, 34-27. The second half, Rose cut the margin to 3 points before Smith and Stroupe fouled out. Vincennes won pulling away 68-61.

Ron Jennings led the Engineer's offense with 18 points followed by Don Dekker with 13 and Sherm with 10.

January 28, the Engineers traveled to Carlinville to set back the hosts 81 to 69.

Center Sherm Smith fired in 11 field goals and 3 free tosses for 25 points to pace Rose to its first conference victory in 4 tries. Ron Jennings tallied 22 points for Rose who now had a 2-12 record.

Blackburn's Beavers trailed 42 to 39 at halftime and fell farther behind as Coach Jim Carr's five improved their fast break game. Jim McClure of the hosts captured the games scoring honors with 27 points. Rose's Don Dekker consistently drove through the Beaver's defense to score 16 points.

The Rose men faced a big and experienced Oakland City squad at the Rose field house. The Oaks poured through 55 points in the second half to down Rose 101 to 62.

The much taller visitors controlled the boards and Rose drew a number of fouls fighting for the ball, which cost the Engineers the services of three players on personals. Until Oakland City's height began to tell, Rose made a show of it in the first half. The Engineers led 24-20 after 10 minutes but were behind 46-32 at the half.

Ron Jennings and Woody Stroupe were the offensive guns for Rose with 20 and 15 points respectively. Stroupe was one of the 3 players lost on fouls, as usual.

The following night a sluggish Rose quintet faced Illinois College in an away ball game. The Engineers could not get in gear the first half and fell behind 32-22 at the intermission.

Rose was fired up the second half and managed to cut the deficit to 4 points with 6 minutes to go in the second half. The cold shooting Rose quintet managed to place only one man in the double figures. Ron Jennings hit for 19 points.

The Engineers traveled to Oakland City to face the Oaks for a (Continued on page 29)
“ALS”—Automatic Landing System for Aircraft in all weather operations.

This wholly automatic landing device used by the new Boeing 150-passenger jet airliner set a fresh milestone in the annals of flight. It may well cause spectacular changes in airliner operation in the near future.

This new Automatic Landing System (A.L.S.) is designed to get aircraft to the ground in weather when even the birds are walking! This new landing system has proven itself without a doubt. It has landed the large airliners like the Boeing and DC-7's and an F-86 jet fighter. It has also landed planes on an aircraft carrier at sea—compensating for the pitch and roll of the deck.

The system is precise, so much so that even if the pilot of the plane fiddles with the controls the operator can tell it.

Bell Aircraft, which devised this piece of equipment, is confident that the day has arrived, at long last, when airliners can operate with the regularity of trains, regardless of weather.

With two such systems guiding and controlling alternate aircraft, Bell figures that it could bring in upward of 100 planes an hour in thick weather compared with 12 an hour for an average airport.

The essence of simplicity, as far as the airplane's equipment is concerned, adds only one item. This is three pieces of aluminum riveted together to form a corner, like that where two intersecting walls meet a ceiling. This piece of equipment is called a reflector, which is about 14 inches long and weighs three pounds. It is normally mounted to the top of the plane's front landing gear leg.

The system is simple from the airplane's standpoint. But it's something else again in the ground equipment. There is located in the ground equipment a complicated electrical robot, something on the order of an analog computer, that solves problems for the automatic landing system.

It sounds easy—and it is, but there are two things that the automatic landing system needs for perfect precision. The first of these is a tracking device as sensitive as a bloodhound's nose to follow exactly and report the movements of an airplane preparing to land. This is radar. The second need is some means of establishing a proper glide path, correct to the inch, for two or more miles from the inbound tip of the runway. This is the analog computer.

The airplane that is going to land by the automatic landing system is flown into an imaginary "gate" two or more miles from the runway. At this point the computer and radar take over the automatic pilot in the plane.

The pilot throttles down his engines for the glide, extends his flaps for more lift, puts his wheels down, and settles back in his seat while the ALS lands the plane.

There are never any worries about the automatic pilot over control, because the signals eminate from the computer at 10 times a second.

The frequency of this system is 35,000 megacycles. This is above the highest officially designated band, which is the super high frequency (SHF), which ends at 30,000 cycles per second. The reason for the high frequency lies in the fact that it offers such high precision.

(Continued on page 30)
SALES ENGINEERING

Industrial Salesmen

By Ray Clark, soph., chem.

One avenue of thought concerning the engineer is that he is a person who is responsible for cutting costs and increasing efficiency in such a manner as to increase the profits of a company. In general, this is true; but if an engineer succeeds in developing a machine which will make all old methods of production obsolete, this product must be sold before any profits are realized. This is the job of the sales engineer.

The sales engineer is a salesman who cannot depend on catchy phrases or a colorful wrapping to sell his product. There is generally no nationwide television and magazine advertising to acquaint the potential buyer with the merits of his product. The greatest challenge in this field of endeavor is that this is a job which one man must do and must do well.

The training of a sales engineer is usually varied, and no definite pattern has yet been outlined as the best procedure to follow. There are a few general suggestions, however, that might be helpful. (1) Acquire a general engineering knowledge as opposed to a specialized field. It is widely known that any product of complexity requires the work of various engineers who are specialists in their chosen field. For you, the salesman, to convey their sentiments as to the worth of their product, you must have a knowledge of the vocabulary of each of these fields. (2) Spend more time in learning to write more clearly and concisely. You must often write to a potential customer for an appointment and if your letter does not have a good appearance, it will often end up in the round file, the waste basket. (3) Develop your ability to meet and converse with strangers. Often the first impression you make will make or lose your sale no matter how good your product is. There have been numerous volumes written on how to improve your personality, but a warm friendly smile is a great salesman in itself.

After you feel you are prepared to enter this battlefield of business and come out the victor, you should make a careful study as to the company for which you wish to work. First ask yourself if the company is mature. How long has it been in business? What kind of dividends are paid on its stock? How old is the management of the company? All of these questions are in the minds of the customers so you had better think about them. It is much easier to sell for an established company than for a fly-by-night concern. Next find out how the company treats its salesmen. Are they sent on extensive road work? Do they receive adequate commissions? Are they allowed to continue studies in their chosen fields? Is creative thinking required? It would be a shame to waste your four years of preparation on a job which could be accomplished by any ordinary salesman.

When you have decided on a company and have started your work, what should you expect? Most companies will expect their sales-engineers to use creative thinking. You may not use your “book learning” but the methods you used in solving engineering problems are still good when solving customers problems. You may also be asked for suggestions on new uses for your products. You will probably be required to do a great deal of traveling. Personal contact with customers is essential in many instances. After you have been with the company for a while, you may be asked to accept a position with management. The sales-engineer probably has a better chance than any other person to make good management potential because of his experience with the problems of both his company and its customers.

Just why should you enter this field of sales engineering? There are many reasons for joining this branch and perhaps the most important is the dislike for sitting in an office or laboratory all day long. Meeting new people and new problems is a stimulating experience which you will have every day in sales engineering. For the person who thrives on competition, he can satisfy this desire with sales.

If most of the young men entering this field of sales were asked, they would probably say, “This is the place to make the most money.” If this bothers your conscience, you can still point out that you are creating a payroll for hundreds of other people through the manufacturer of your product. This humanitarian thought will help you when you receive your first commission check.
The 1959 Military Ball has come and gone, but gay memories remain in the minds of Rose men and their dates.

At intermission, Miss Jackye Murphy, sophomore at the Indiana University Medical Center in Winamac, Indiana, was sworn in as Honorary Cadet Colonel. Others in her court (page 11) were Misses Jo Redenbarger, Rushville; Marlene Vukowich, East Chicago; Janet Miner, Evansville; and Judy Dukes, Terre Haute.

Winner of the traditional O'Grady Drill competition was John Davis, senior M.E. The Rose Band was the recipient of the Attendance Award.

Col. Murphy is sworn in.

"O'Grady says, 'Dress Right, ...'"

"... Music by Bernie Hayworth"
The Willgoos Turbine Engine Test Facility is the world's most extensive privately owned turbine development laboratory. Designed and built specifically to test full-scale experimental engines and components in environments simulating conditions at extreme altitudes and speeds, it is currently undergoing expansions that will greatly increase its capacity for development testing of the most advanced forms of air breathing systems.

In chambers like this at the Willgoos Turbine Engine Test Facility full-scale engines may be tested in environments which simulate conditions from sea level to 100,000 feet. Mach conditions can also be simulated here.

In the new Fuel Systems Laboratory engineers can minutely analyze the effects of extreme environmental conditions on components of fuel systems—conditions such as those encountered in advanced types of flight vehicles operating at high Mach numbers and high altitudes. Fuel for these tests can be supplied at any temperature from −65°F to +500°F.
Unmatched Engineering Facilities for Developing Advanced Flight Propulsion Systems

Operations at Pratt & Whitney Aircraft are essentially those of an engineering and development organization. As such, an engineering atmosphere dominates the work being done, much of which directly involves laboratory experimentation.

In the past three decades, expansion at Pratt & Whitney Aircraft has been almost tenfold. In recent years, greatest emphasis has been on extending engineering facilities to meet the needs of advanced research and development programs in flight propulsion.

Among the Connecticut P & W A facilities are many that are unequaled in the industry. Thus today, Pratt & Whitney Aircraft is better prepared than ever to continue development of the world's best aircraft powerplants...to probe the propulsion future...to build and test greatly advanced propulsion systems for coming generations of flight vehicles—in whatever form they take.

The Connecticut Aircraft Nuclear Engine Laboratory, operated by Pratt & Whitney Aircraft, is situated on a 1,200-acre tract near Middletown. The Laboratory was specially built for the development of nuclear flight propulsion systems.

For further information regarding an engineering career at Pratt & Whitney Aircraft, consult your college placement officer or write to Mr. R. P. Azinger, Engineering Department, Pratt & Whitney Aircraft, East Hartford 8, Connecticut.
Mr. Byron G. MacNabb attended Rose Poly in 1932. He is not a Rose graduate, but he considers it his Alma Mater, and we’re proud that he does. Byron is now Mr. Missile at Cape Canaveral, Florida; officially he is operations manager for Convair-Astronautics at the Air Force Missile Test center. As operations manager, MacNabb is responsible for the supervision of the construction of all the Atlas launching facilities. The center’s headquarters are at Patrick Air Force Base, eighteen miles south of the cape. Convair offices are located between the two in order to be as close as possible to both.

The MacNabb’s make their home in Cocoa Beach, Florida, and have a daughter who lives in New York.

Byron MacNabb is one of those men who plays as hard as he works. On a Sunday afternoon, in his home with its backyard right on the Banana River, he will do the following things in any order. Cast for a sea trout right off his own dock; go into the house for a drink and explain to a caller the intricacies of a “rate gyro” (an instrument governing the speed of correction of a deviation of course), and stomp outside again to improve the house’s drainage system with a shovel. He is quick-moving, sharp-witted, good-natured—and above all, dedicated to his work.

For thirteen years before World War II, Mr. MacNabb worked for the Carnegie Steel Corporation at South Chicago, and was general foreman in the blast furnace department when he entered the Navy. He served as an ordnance officer on aircraft carriers, with shore duty in research and development at the Navy Air Test Center, Patuxent River, Md. There he won a Presidential citation for development of an Anti-Kamikazi weapon for use against the Japanese suicide planes. He also took part in the first firing of a ballistic missile from a ship at sea.

From 1948-1955, he had research and operations posts with Scandia Corporation, the Pullman Standard Car Company, and the Cambridge Corporation. With the latter he was field operations manager on the hydrogén bomb program at the Atomic Energy Proving Grounds in the South Pacific. He joined Convair-Astronautics in February, 1955.

Mr. MacNabb recently returned to Rose to talk to the students concerning the Atlas missile and missile program. His last visit was in 1952, but he hopes to return next year for Homecoming.
A Campus-to-Career Case History

H. James Cornelius graduated from Swarthmore College in 1954 with a B.S. in Electrical Engineering. He's been “growing” ever since with the Bell Telephone Company of Pennsylvania.

After an initial 44-week inter-departmental training course, Jim was made Facility Engineer in charge of the fast-growing Norristown-Pottstown area. In that capacity, he engineered over half a million dollars' worth of carrier systems and cable facilities between major switching centers in Pennsylvania.

Today, he is one of 50 young engineers from the Bell Telephone Companies chosen to attend a special Operating Engineers Training Program at Bell Laboratories. This 19-month course of study—with full pay—deals with advanced techniques and new concepts in electronics which signal a new era in telephony. It involves both classroom theory and practical laboratory applications.

When Jim and his colleagues return to their companies, they'll review major engineering projects. This will assure the best use of equipment for current engineering, as well as for expected new developments in communications.

"I wanted a job I could grow with," says Jim, "and I've got it. I can't think of a better place than the telephone company for an engineering graduate to find a promising future."

Many young men like Jim Cornelius are finding rewarding careers with the Bell Telephone Companies. Look into opportunities for you. Talk with the Bell interviewer when he visits your campus. And read the Bell Telephone booklet on file in your Placement Office.
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Convair-Astronautics' great new $40 million facility in San Diego was created solely for the purpose of putting America first and farthest into space. Here, graduates will participate in the program of the nation's mightiest missile, the Atlas ICBM, which powered the biggest satellite into orbit. Other programs involve lunar and interplanetary exploration. Many members of our staff rank among the world's leading authorities in their fields — distinguished scientists and engineers to direct your career progress. We urge you to consider a future at Convair-Astronautics.

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CONSULT YOUR PLACEMENT OFFICE FOR FURTHER DETAIL
New Periodicals

The following magazines have been added to our subscription list for 1959. (For a complete listing of the magazines received in the library, see the February Newsletter.)

ARS Journal (formerly Jet Propulsion)
Aero Space Engineering
Astronautica Acta
Astronautical Sciences Review
Audio Engineering Society Journal
Collegiate Baseball
Electronic Technician
   (includes Service)
Electronics Illustrated
Forbes
Journal of Chemical and Engineering Data
Modern Castings
New World Review
Scholastic
Scientific Research.

RECORD COLLECTION

The library was recently the recipient of a small grant to be used to establish a record collection. We have ordered a few records—such things as Carousel, My Fair Lady, and works by Chopin, Dvorak, Gilbert and Sullivan, Goldmark, Mendelssohn, Mozart, Strauss, and Tchaikovsky—for a starter. We shall appreciate any suggestions from the faculty and students.

NEW BOOKS

A Friend in Power, by Carlos H. Baker.

The scene of this novel is a university town somewhere within the radius of New York City. The action revolves around the search for a new university president to replace the man who is resigning after thirty years of unselfish devotion to the job. The university board of trustees which is charged with finding the right man has asked that a faculty advisory committee be formed to assist them in their task.

The book consists of nine chapters, each of which deals with one month's events beginning with October and ending with June when a new president is finally chosen. Day to day university life is clearly delineated with all of its problems, frustrations, and satisfactions. We see the inner workings of a committee of unselfish, sincere men trying to do well a somewhat thankless and time-consuming job. We learn what a university needs in the way of top administrators and why some men measure up to those standards and why some are discarded.

God Bless Our Queer Old Dean, by W. Storrs Lee.

In this amusing, authentic account of what makes college machinery go round, the author offers a reappraisal of the American dean and his complicated job—the dean as contact man, counselor, confessor, disciplinarian, benefactor, scapegoat. He writes nostalgically of the old "intuitive" deans like Briggs of Harvard, "Tommy Arkle" of Illinois, Hawkes of Columbia, Gauss of Princeton, Coulter of Purdue, Goodnight of Wisconsin, Straub of Oregon, and brings the reader up to date by introducing the modern, trained specialist known as the Student Personnel Administrator or Vice-President in charge of student services.

Alumni of any college and of any generation will be startled to find themselves cast in the chapters; anxious parents hoping by hook or crook to get a son into college in an era of crowded campuses will find the right kind of counsel here; and both prospective students and those currently enrolled will be rewarded with a new interpretation of the man who is in a position to offer them the best kind of assistance.

Rocket to the Moon, by Erik Bergaust and Seabrook Hull.

In one giant step, men will soon stride 240,000 miles—ten times the distance around the world. Rocket to the Moon is a factual and provocative book about the greatest physical step of all time—escape from the earth, flight to the moon and beyond. More absorbing than space fiction, it brings you all the known information, all the significant ideas and assumptions on the conquest of the moon and its results.

Many complex technical problems face our space experts before they can take this giant step. The authors tell you how we will approach the moon, first with instrumental probes

(Continued on page 32)
LAMBDA CHI ALPHA

There are many new faces at the Lambda Chi house now. The brothers of Theta Kappa are now joined by pledges from the freshman class. The new pledges are: Skip Shineman, Decatur, Ill.; Ron Klinec, Cleveland; Richard Laxen, Terre Haute; Don Bonness, Terre Haute; Steve Ban, Hammond, Ind.; Don Robinson, Mt. Carmel, Ill.; Richard Mills, Indianapolis; Andy Hrezo, Gary, Indiana; and Joe Andel, Brookfield, Ill. There is also one pledge who is a sophomore, Alan Johnson, from Terre Haute.

The new officers elected in February are now in office. They are: Gary Phipps, president; Bob Cheekley, secretary; Bill Schaper, vice-president; Steve Burton, treasurer; Bill Fenoglio, rush chairman; Noble Huff, pledge trainer; Russ Archer, ritualist; Dick Pike, social chairman; Ron Ireland, house manager; Warren Griffith, steward; Jim Gates, ass't. treasurer; and Larry Myers, ass't. ritualist. Congratulations and good luck to the new officers.

Congratulations to Brother Schaper. Bill is now pinned to Sally Scarlet, who is a student at Indiana State and a member of the Gamma Phi Beta sorority.

Lambda Chi Alpha has won the scholarship trophy for the first semester of this year. We are proud to receive the trophy for the tenth straight semester.

Theta Kappa enjoyed entertaining the freshmen at the rush parties last month. Brother Overby did a very fine job as rush chairman. Brothers Gates and Dekker put on a skit which they wrote.

Sigma Nu

Hello again old readers of the Serpent's corner, its time to give forth with the joyous news concerning this year's rush and our eighteen new pledges. We hope that every aspirant to knighthood—regardless of his decision—has thought carefully and chosen wisely as we are sure he has, and we wish at this time to announce the following men as probationers of Sigma Nu: Ron Bilyou, Gary Valbert, Tom Brown, Lee Brda, Joe Sparks, Harvey Burkett, Fred Morgen, Ross Dring, Don Price, Morris Clevery, Paul Sabla, Dick Ferency, Bob Pesavento, Richard Herrick, Don Rainey, and Ken Montgomery. We think these men are eighteen of the best, and we feel sure that they are worthy to enter the legion of brotherhood. Of course, I'm not one to say that progression along this road will not entail a good bit of work and study by all these men and probably a considerable amount of horse-play also. But I and my brothers know that the bene-
fits of knighthood both fulfill and enrich your life tremendously.

Socially speaking, we have quite a bit coming up. The 25th of April is not far away, Help-Day is the headline at that date. State Day and Easter Vacation are just passed, but three Sorority mixers and two date parties are coming up in the next month and a half. The I.F. dance is also drawing near, and for several weeks now singing voices have been heard daily in the house on good old South Center. We have had (and are planning to have) several members of the Faculty in for dinner and have had several Alumni drop in for a chit-chat, rather frequently. This is good and we hope that we can have many more. A party with the T.E.E.'s is in the works and periodically we have been having “Pin” parties. That just about rounds out our agenda for the present.

That's all I have for now in the reporting line, so to all of you who have gumption enough to read this article to completion I will bid you —’bye for now.

Fred M. Ryker

THETA XI

With the rush parties over the men of Theta Xi are at last settling down to some serious sleeping . . . er I mean studying. The parties were great fun and we hope that everyone enjoyed themselves at 902 South Sixth.

Fourteen freshmen make up this year's spring pledge class and we feel that it is one of the finest classes we've had in a long time. Those pledging Theta Xi are: Ron Andis, George Bentley, Paul Blase, B. B. Borror, Bob Brown, Chuck DeWeese, Mike Gilpatrick, George McClellan, Jim Malone, Jerry Oxley, Dan Pool, Dave Reese, Richard Schafer, and Eb Thompson. Congratulations men on your choice. We know you will make fine TX men.

Under the watchful eyes of this year's pledge trainers, Ken “Holly” Hollingsworth and Larry Wilson, the pledges are headed for a fine instruction program.

The TX tigers are leading the basketball league for the second consecutive year with a 5-1 record. With some expected support from our pledges and with our already spirited active team, we are sure to keep our first place position.

From the social department of dear old Theta Xi comes the report of many planned activities. Mixers with various sororities, St. Mary-of-the-Woods, and the annual Bowery Ball are at the top of the list. I would like to remind everyone of the Inter-Fraternity Dance which will be held in the very near future. This Saturday night TX plays host to all the fraternities of the Rose Campus with a mixer following the basketball game.

In closing we of Kappa extend our congratulations to all the Rose freshmen who chose to pledge a fraternity! Until the next issue, I'll simply say so long, you-all.

Larry Pitt

ALPHA TAU OMEGA

The Indiana Gamma Gamma Chapter of Alpha Tau Omega Fraternity is extremely proud to an-

(Continued on page 33)
weight design in sandwich panels using honeycomb core, it is best to have the skins approximately one-tenth the panel thickness and the weight of the facings approximately 65% of the total panel weight. By using these simple proved facts it is possible to roughly design a honeycomb panel of minor design very easily.”

While considering cost and manufacturing methods, sandwich structures utilize the best combinations of available materials to satisfy demands of stiffness, rigidity, and lightness.

**HONEYCOMB TODAY**
Three honeycomb core materials are in common use today. Paper honeycomb, cheap to make and easy to use, has found dozens of uses in architecture, refrigerator walls, truck bodies, doors, and similar places. In aircraft and missiles, paper, glass-reinforced plastic, and aluminum are all commonly-used core materials. Paper is used because it is cheap, glass-reinforced plastic because it has excellent thermal and electrical insulation properties, and aluminum because it has a high strength-weight ratio and is fire-resistant.

A new factor, supersonic flight, has forced the development of a new honeycomb capable of withstanding high temperatures and high stresses. All-metal honeycomb sandwich structure seems to be the answer to this problem. This honeycomb is a sheet metal assembly of foil-thin ribbons in honeycomb pattern comprising the core brazed or welded to metal facings.

Steel alloys are usually used in the manufacture of all-metal sandwich material since they have the ability to maintain their strength at temperatures up to 1500° F. Aluminum and titanium show necessary strength at lower temperatures, but at high temperatures their strengths fall off rapidly.

Many different core designs have been used for all-metal honeycomb. Among the most common are the squarecell, multiwave, sincecell, and hexagonal cell.

Many types of bonding, i.e., fastening the facings to the core, have been used too. Adhesive bonded sandwich is suitable for low temperatures; at the high temperatures reached in supersonic flight the core is either welded or brazed to the surface facings. Brazing is better than welding because the joint is continuous and has high strength. The brazing temperature is around 1900° F., and thus there is unlikely to be a failure at temperature encountered by honeycomb in aircraft and missiles.

The newest type of honeycomb, designed to take temperatures up to 2000° F., is a ceramic honeycomb, made complete with ceramic skins. This ceramic sandwich material, which is still in the testing stage, is an outgrowth of an asbestos honeycomb for firewalls that was developed by the Continental Can Company.

At the present, aircraft and missiles are using virtually all the available high-temperature sandwich, but some commercial usage is expected in the next few years. Many, many possible applications exist in industry. Large-scale use of all-metal or ceramic honeycomb is sure to decrease its cost and increase the number of economically feasible applications.

**ADVANTAGES AND DISADVANTAGES OF HONEYCOMB**

Honeycomb was originally developed to reduce the weight, without reducing the strength, of aircraft parts. Many advantages, varying with the design of the honeycomb sandwich, have become evident since its introduction, and have caused its widespread use as a structural material. A. J. Carah summarized many of the advantages when he said: “Honeycomb core material, bonded into panels, is capable of working the face materials up to their yield strength. The core thus carries shear, tension or compression components normal to the skin, and stabilizes the faces to prevent buckling.”

Honeycomb sandwich structures are ideal materials where rigidity, strength, and light weight must be combined. This makes them especially useful in aircraft and for paneling. Honeycomb also has a great value as an insulating material. The recently-developed all-metal honeycomb has the advantage of resistance to extremely high temperatures.

Honeycomb still has certain disadvantages which must be recognized. A serious problem is moisture absorption where paper or fabric is used for honeycomb cores. This leads to corrosion of the faces and other structural members in contact with the wet core. The result may be lowering of panel strength and weakening of the bond between the core and facings. Static tests of missile fins returned from service have shown a reduction in strength up to 50% due to corrosion of magnesium structural members in combination with epoxy adhesives. To a somewhat lesser degree aluminum alloys are subject to the same deterioration.

Another problem is impact strength. For honeycomb, impact strength is the resistance to local crushing of the core when it is subjected to a blow. Honeycomb core resistance to this sort of blow is low; nevertheless, the overall effect of such a crushed area in a typical sandwich structure is negligible unless a large area has been crushed.

Thus the disadvantages to honeycomb are present. However, if these disadvantages are realized and considered, there are thousands of practical applications for honeycomb sandwich material. Builders and manufacturers are entering a “honeycomb holiday” where honeycomb will be used as a structural

*(Continued on page 34)*
MANY SCIENTIFIC SKILLS are needed to meet the research challenges of the petroleum industry. Shown above are (l. to r.): Kemp Bunting, mechanical engineer; Arthur Sisko, physical chemist; Thornton Traise, organic chemist; Wilbur Hayne, chemical engineer. They are members of the research team that developed Standard Oil's revolutionary new Supermil ASU greases. These amazing lubricants are the first to deliver normal performance at both extremely high and low temperatures.

Four heads are better than one

Seldom is a major petroleum advance the work of one man—or one kind of knowledge. It is the result of a group of scientists whose skills encompass many fields.

Take Standard Oil’s amazing new Supermil ASU greases, for example. These revolutionary lubricants assure normal performance at fantastic temperature extremes—from 70° F. below zero to 480° above. Their development has made possible major advances in America’s Space Age defense program and its industrial efficiency.

The story behind the development of Supermil ASU greases is as fascinating as the products themselves. For it is a story of Standard Oil research teamwork. Physical chemists, organic chemists, chemical engineers, mechanical engineers and technicians worked together for five years to break down a major barrier in the lubricant field.

At Standard Oil, scientists and engineers of many types have the opportunity to work on a wide variety of challenging projects. That is one reason why so many young men have chosen to build satisfying careers with Standard Oil.
Research & Development

By Jon Stiles, soph., m.e.

NEW FLIGHT DATA RECORDER

Development and sale of a new, simplified, lightweight, multi-channel flight data recorder was announced by Waste King Corporation. The Waste King unit, a completely self-contained mechanical scribetype recorder for sensing and recording all CAA—TSO requirements except for vertical acceleration. An external accelerometer is provided.

Among the unit's unique features is the inscription of recorded information on a specially-coated and almost indestructible metallic tape. The magazine holds 200 feet of tape which will accept 200 hours of flight data recording. Inscription is accomplished by scratching through the coating without embossing the tape so that both sides of the tape can be used for recording. In this way a total of 14 channels of information can be accommodated.

Timing is accomplished without either an actuator or any additional devices. The recording medium is driven at a speed of one foot per hour and is controlled by an accurate escapement mechanism. Sprocket holes, spaced exactly one minute apart, engage the medium with the escapement.

These compact records will form a complete flight history for each aircraft.

PLASTIC IGLOO MARKS TRIUMPH OF WHITE MAN

There is nothing like an igloo, unless it is an igloo made of plastic. Eskimos will be among the first to admit this.

Brainchild of an officer in the Canadian Department of Northern Affairs and Natural Resources, the new, lightweight igloo marks the white man's triumph over those pains-takingly built by the Eskimos for a thousand years.

The new igloo is impervious to summer thaws, bain of the traditional Arctic snow block house. Inside, the temperature can be kept at an even level. The plastic igloo is warmer than one of snow blocks and is unaffected by Arctic winds.

Standing on barren Baffin Island in the Eastern Arctic, the plastic igloo, was constructed by an Eskimo with a reputation as a man who could build a snow igloo in a hurry. He laid the foundation blocks on a circular, two-layer plywood floor. Sandwiched in between the layers was plastic foam. With a saw-knife he shaped the plastic blocks to the proper size. Snow blocks are held together by gravity. But this modern Eskimo used wooden skewers to secure the plastic blocks. A chemical adhesive was used to hold the 18" x 30" blocks together.

Measuring 9 feet high and 18 feet in diameter, the finished igloo can be picked up and carried easily by four men. Its roof will support a 360 pound load. Inside there is silence, despite the 85 mile per hour winds that lash the outside.

In the traditional snow block house the Eskimo whale oil lamp cannot raise the temperature much over 30 degrees. But a small stove, relying on only a kerosene wick, can heat the inside of the new igloo to 105 degrees within several hours, even in the face of an outside temperature of 40 degrees below zero.

No longer does the Eskimo have to live in a drafty tent while he waits for snow that is just right for building an igloo. After a thousand years, the snow igloo is on the verge of becoming as extinct as the wooly mammoth.

MODULATED BRAKE

An important truck brake safety development made possible through the use of air suspension has been announced by General Motors. The new device, known as the modulated brake, permits the highway tractor to approach minimum stopping distance under all load conditions, and reduces the stopping distance to near that of a passenger car.

Air suspension permits the addition of a brake regulating valve which automatically adjusts the braking effort at the rear wheels in proportion to the load on the wheels.

In actual operation this new brake development automatically assures the braking stability of the tractor under all load conditions. At the same time the driver is free to independently control the trailer brakes as required by highway or maneuvering situations. The net result is a marked gain in operating safety.
return match. The Engineers outplayed the much larger hosts for 7 minutes but then began to tire and fell behind 48-36 at the half. The second half the Oaks pulled away and won 97-68.

February, Rose returned home to set down Principal 79-74 avenging an earlier 14 point defeat. The Engineers repeatedly broke the Indians' zone defense to spring to a 20-11 lead midway through the first half. Rose hit a cold streak and the Indians cut their deficit to 3 points at the half. With seven minutes left in the second half, the Indians grabbed the lead by one point, but Smith and Pool combined for 17 points to ice the game for Rose. Ron Jennings who repeatedly drove through Principia for the bucket, was high for Rose with 24; Smith followed with 23 points.

Rose played its last road game against McKendree. Rose could not find the mark while the visitors were busy hitting 7 of their first 10 shots. The only highlight of the game for Rose was that 4 men were in the double figures. Larry Grimes led the pack with 18 points and Dekker, Smith, and Jennings following respectively.

Rose returned home to defeat Blackburn for the second time of the season. Although Rose scored several times on fast breaks, both teams played a slow and deliberate ball game. Blackburn jumped to an early lead but the Engineers fought back and owned a 25-24 lead at the intermission. The second half saw the lead change hands several times with Rose taking a 5 point lead with 2 minutes to go. Two errors almost cost Rose the game, but when the buzzer sounded the score read: Rose 48, Blackburn 47.

The boys won that game for the large crowd cheering for them. There were probably more people at that game than all the others put together.

Rose played its last game Feb. 25 against Greenville, the number 2 team in the conference. Again Rose was cold while the visitors were hot and Rose fell behind 23-38 after 10 minutes of play. The second half Rose pulled within 8 points but fell behind losing 67-50. Jennings and Smith each hit for 13. It seemed hard to believe that senior co-captain Larry Grimes had made his final appearance on the Rose hardwood.

Although Rose had a 4-14 record, the inexperienced squad improved greatly and outlook for 59-60 is fairly bright. The following men lettered: Larry Grimes, Larry Berger, Sherm Smith, Don Dekker, Ron Jennings, Joe Gladden, John Tindall, Dan Pool, and Woody Strouple. Sherm Smith and Woody Strouple were elected co-captains for next year's b-ball season.

INTRAMURALS

Most of the winter intramurals are over or will soon will be. The regular basketball league ended in a 3 way tie for first place with the Junior Hawks, Seniors, and Sophomore Lakers. Their playoff will determine the league winner. After the playoff there will be a tournament for all 12 teams. All I M points will be given for the first and second place teams.

Standings:
Junior Hawks 7 1
Seniors 6 1
Lakers 5 1
Soph. I 4 2
B II 4 3

Volley ball is finished with the Seniors being the undisputed champions. The Seniors won all their regularly scheduled games and also won the volleyball tournament which consisted of 4 teams: Seniors, Tinker, I F, and Demeter. The final standings are as follows.

Seniors 5 0
Demeter 5 2
I. F. 3 2
Tinker 3 3
Juniors 3 3

In Fraternity basketball TX is well ahead in the race for the championship. Unless they have a few upsets they will probably be the B-ball champs. With only a few games left the standings are:

TX 6 1
ATO 4 3
Sigma Nu 2 4
Lambda Chi 1 5
Bowling is all but over with Bill Kuchar's "large boys" bowling team winning all but one of their games.

With one game to go, here are the standings:

Wins Losses
Kuchar 13 1
McClellen 11 3
Pike 12 4
Ransford 10 6
Fac. Blake 13½ 4½
Galginatis 9 8

The individual high bowling average is still held by Phillips with 340 for a series. Lydick was next with a 339 average series. Blake of the faculty has the highest average of all the bowlers with a 363.

With the indoor season finished everyone is anxiously awaiting a good outdoor intramural program for this spring. We hope as much interest is shown in the spring season as was shown in the winter months.
AUTOMATION IN THE AIR
(Continued from page 15)

The engineers who conceived the system and nursed it to maturity are realistic. They know that pilots as a breed look biliously at anything that substitutes for manual airplane control during landing. But if pilots can be made to trust the system, a long stride will have been made toward all-weather operations.

The “ALS” functions by telling the airplane’s automatic pilot what to do to get on the prescribed glide path and to get lined up with the runway. The ideal glide path fixed by the computer at a given point is for example, 1125 feet above ground level. The plane is at 1400 feet. The computer subtracts 1125 from 1400, and energizes a command radio to say to the automatic, “You’re 275 feet too high.” It corrects the same way to line the plane up on the runway.

When the plane is a few feet from the runway, the computer flares the plane out and brings up the nose so the plane will settle on the main wheels. There has been a little trouble at this point during the landing, but not from the computer! The trouble lies in the fact that pilots want to jockey around with the controls, and this sort of play leads to bad landings. Bell has met this problem by devising a control that keeps the pilots from playing with the controls.

No complex system like this is any good unless it is “fool proof”, that is, it provides a way out if something goes wrong. The Bell system arranges for this. An airplane pilot watches his descent on the cross hairs of his cockpit “ILS”. If they don’t center, he can take over the controls. He is in constant radio communication with monitors on the ground. The monitors sit at a console full of dials that constantly check and double check the computer and plane. If anything goes wrong or if the computer misbehaves a panel lights up in the pilots cockpit to let him know. By this method the system is undoubtedly “Fool Proof”.

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It is partly through this method of training that DuPont develops its management men of tomorrow. And the need is increasing every day for qualified people to supervise the development, production and distribution of new products as well as Du Pont’s 1200 existing products and product lines. So if you join DuPont you can be sure that you will retain your identity as an individual and be prepared for advancement as quickly as your abilities—and job openings—permit.

WATCH THE DU PONT “SHOW OF THE MONTH” ON TELEVISION
Brain Teasers

(1) If a Vertical tree 30” in diameter has a notch cut in it to the center, what is the volume removed if the lower plane of the notch is horizontal and the upper one makes an angle of 45° with the lower?

(2) You are traveling in the mythical land familiar to all problem buffs, where there are two types of people, those who tell nothing but the truth and those who tell nothing but lies. Of course, they look alike. You arrive at a fork and desire to know whether to take the right or left fork to reach Truefalseville. Two natives stand at the fork and you are allowed to ask each one a single question answered yes or no. What questions would you ask?

(3) A locomotive watering tank is to be located alongside a straight section of railroad and supplied with water from two wells located on the same side of the track and located respectively 1 mile and 3 miles from the track. The distance between lines drawn through the two wells perpendicular to the rail required to connect the two wells to separate inlets on the road is 3 miles. What is the minimum total length of pipe watering tank?

LIBRARY NOTES

(Continued from page 23)
and then with man himself as a payload. You share all the tension and excitement of the first manned voyage of exploration around the moon, as this incredible adventure is imagined in vivid detail. Fascinating conjectures, based on the latest scientific findings, show you what life on the moon may be like, how men will build a base there, how they will explore the moon and what they expect to find, and how they will push on from there to further explorations of outer space. On every point you will find scientists’ most reliable guesses as to what men will encounter on their first journeys beyond the earth.

Moon rockets already are being prepared on their launching pads. In a dramatic concluding chapter you will read an eye-witness account of the first lunar probe launchings from Cape Canaveral, including the first detailed description of a countdown on a big modern missile ever presented to the public.

Answers to last month’s problems.
1. 364832
   75732
   8584
   984
   450132

2. This requires a little sailing knowledge, inasmuch as it is possible for a sailboat to tack into the wind. On Monday, the boat “saw a dead calm, and, therefore, its speed was the same as that of the river. On Tuesday, however, the boat saw a headwind, which it could advance against by tacking. The boat went downstream more quickly on Tuesday, because its speed was that of the river plus whatever it could make by tacking against the wind.

3. Fashbuck beat Up-State. Notice that it is only possible to have that particular won-lost record if each team beat every other team below it in the standings.

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announce the pledging of seventeen men following rush weekend, February 14-15. These new ATO pledges include:

Paul Funk, (Jr. Ch.E.) Terre Haute
T. C. Copeland, Fern Creek, Ky.
Dick Cordill, Indianapolis, Indiana
Joe Dickey, Lebanon, Indiana
Dick Foss, Tulsa, Oklahoma
Carl Garman, Terre Haute
Gary Liffick, Terre Haute
Dave Lindzy, Mishawaka, Indiana
Jack Munro, Indianapolis, Indiana
Dale Oexmann, Vincennes, Indiana
Don Ramsey, Anderson, Indiana
Joe Snyder, Indianapolis, Indiana
Dave Starnes, Arlington Heights, Illinois
Dave Strilich, Hobart, Indiana
Dave Wallace, Dunkirk, Indiana
Fred Wright, Louisville, Kentucky

The entire active chapter wishes to extend our congratulations to our new pledges. ATO knows these new pledges have the spirit, leadership, and ability to continue the ATO tradition at Rose.

ATO also wishes to extend our congratulations to the other fraternities on campus for their new pledge classes and to their new pledges.

The varsity basketball team completed their season February 24. The season was not the outstanding success Rose enjoyed in football, but the Fighting Engineers lived up to their nickname even in defeat. Alpha Tau Omega wishes to congratulate late Coach Jim Carr and the whole basketball team for their fine spirit and never-say-die attitude they have exhibited throughout the season. The Alpha Taus are proud to have had 8 brothers and 1 pledge on the squad this year. Larry Grimes and Woody Stroupe were co-captains of the Engineers; Ron Jennings, Sherm Smith, and T. C. Copeland were on the team all year; Jim Sargent and Herb Gormong were with the team the first semester, and Larry Berger and Bob Stark joined the Engineers for the second semester.

After starting slow the Tau fraternity basketball squad has started rolling, winning 3 of our last 4 starts. After winning only 1 of the first 3 games, the Taus clipped Sigma Nu easily in the fourth game.

Then in a sudden death overtime Herb Gormong hit from the field to give us a 47 to 46 victory over Lambda Chi Alpha. Theta Xi defeated the Taus by 1 point for the second time this year in the sixth game, 39-38. Pledge Dave Strilich hit the winning basket for ATO as we won our most recent game over Sigma Nu, 52-51. It seems as though our 4-won, 3-lost record destines us for another second place finish (as in football, but the Taus will certainly be out there fighting in the final two games of the season.

Just last month the engagement of Larry Berger and Miss Jackye Murphy was announced in the ROSE TECHNIC. Now it seems Jackye has had another honor bestowed upon her: at the Military Ball, February 28, Jackye was elected Honorary Cadet Colonel of the Rose Regiment. Must be that other people besides Larry think Jackye is pretty!! Congratulations Jackye!

Two more Taus have lost their pins recently. The two new wearers of the Maltese Cross are Miss Barbara Birck, who is wearing Athletic Director Louis Roehm's pin, and Miss Lynn Allison, who was pinned by Ed Ayres. Congratulations and best wishes to Barbara and Louie, and Lynn and Ed!!

Bill Perkins
NEW TYPE SANDWICH

(Continued from page 26)

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Wing Tips
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Trim tabs
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Trailing edges
Flaps
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Splitter panels
Truck bodies
Truck trailers
Refrigerators
Shipping containers
Pallets
Plastic tooling
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Applications, All-Metal Structural Sandwich

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Empennage
Flight control surfaces
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Wing ribs
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Page 34 THE ROSE TECHNIC
Over the years, we have been hearing of many “barriers” in science... the sound barrier, the water barrier, the thermal barrier.

Of all the barriers, the hardest one to break through has always been the thought barrier. Every one of these “barriers” has been conquered by men to whom the word, impossible, means: “hasn’t been done, yet.”

The sound barrier is a shattered concept, as discredited as the phlogistic theory.

Don Campbell’s Bluebird stopped all talk of the water barrier.

The heat of air friction against the metal “skin” of an airplane was supposed to create a heat barrier at Mach 3. Materials now in production can safely withstand the much higher temperatures involved in flight at Mach 5.

Today the thermal barrier is being called the “thermal thicket”—evidence in itself that no barrier exists.

An interesting point that all of these “barriers” have in common: each was conquered with the help of nickel-containing alloys.

This is not surprising when you stop to consider how many useful properties and combinations of properties are offered by the various nickel alloys:

- Corrosion resistance to a wide variety of solids, liquids and gases
- Strength at high temperatures
- Toughness at sub-zero temperatures
- Unusual electrical properties
- Ability to protect product purity
- Spring properties

When you are faced with a metal problem, investigate Nickel and its alloys. Inco’s List “A” and List “B” contain descriptions of 377 Inco publications which are available to you, covering applications and properties. For Lists “A” and “B,” write Educational Service.

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INCO NICKEL
NICKEL MAKES ALLOYS PERFORM BETTER LONGER
Dean of women: "Didn't you read the letter I sent you?"
Co-ed: "Yes ma’am. I read it inside and outside. On the inside it said, ‘You are requested to leave college,’ and on the outside it said, ‘Return in five days,’ so here I am.”

Being confined in a hospital for a complete check-up, a very shapely blonde was not surprised when a handsome chap dressed in white, came in, pulled down the sheets, and for some minutes looked her over. Shaking his head he left. Shortly, he returned, pulled down the sheet and made another examination. The third time he came in, the blonde, in desperation, inquired, “Say, what in the world am I here for, observation or examination?”

The chap in white replied, “Darned if I know lady I’m just doing some painting in the hall.”

Last night I held a little hand, So dainty and so sweet. I thought my heart would surely break, So wildly did it beat. No other hand in all this world Can greater solace bring, Than that sweet hand I held last night— Four aces and a king.

Girls are just like cigarettes—a fact you must admit. You can’t enjoy them fully until you get them lit.

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

The stranger ambled into the farmyard and was greeted by the farmer. The visitor produced his card and remarked “I am a government inspector and am entitled to inspect your farm.”

Half an hour later, the farmer heard screams from his alfalfa patch, where the inspector was being chased by a bull. Leaning over the gate as the inspector drew near, the farmer cried: “Show him your card, mister—show him your card.”

I love the homework the teachers give, The tests. I hate pretty girls who flirt, The pests! I’m never late to class, nor take My cuts. I do my homework faithfully. I’m nuts!

My parents taught me not to smoke; I don’t. Nor listen to a dirty joke; I don’t. They make it clear I must not wink

At pretty girls, nor even think About intoxicating drink; I don’t. To sow “wild oats” is very wrong; I don’t. Wild youths chase women, wine and song; I don’t. I don’t kiss girls, not a single one, I don’t even know how it’s done, You’d think I wouldn’t have much fun; I don’t.

Probably the reason that God made woman last was that he didn’t want any advice while creating man.

A lion ate a bull. He felt so good he roared and roared. A hunter heard the roar and killed the lion. The moral of the story is: When you’re full of bull, keep your mouth shut.


Little boy: “So what? Who the hell’s afraid of a cow?”

A lonely chick taking a look around the electric incubator of unhatched eggs—“Well, it looks as if I’ll be an only child. Mother’s blown a fuse.”
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Interview with General Electric’s
Earl G. Abbott
Manager—Sales Training

Advancement in a Large Company: How it Works

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

Q. In a large Company such as General Electric, how can you assure that every man deserving of recognition will get it? Don’t some capable people become lost?

A. No, they don’t. And it’s because of the way G.E. has been organized. By decentralizing into more than a hundred smaller operating departments, we’ve been able to pinpoint both authority and responsibility. Our products are engineered, manufactured and marketed by many departments comparable to small companies. Since each is completely responsible for its success and profitability, each individual within the department has a defined share of that responsibility. Therefore, outstanding performance is readily recognized.

Q. If that’s the case, are opportunities for advancement limited to openings within the department?

A. Not at all. That’s one of the advantages of our decentralized organization. It creates small operations that individuals can “get their arms around”, and still reserves and enhances the inherent advantages of a large company. Widely diverse opportunities and promotions are available on a Company-wide basis.

Q. But how does a department find the best man, Company-wide?

A. We’ve developed personnel registers to assure that the best qualified men for the job are not overlooked. The registers contain complete appraisals of professional employees. They enable a manager to make a thorough and objective search of the entire General Electric Company and come up with the man best qualified for the job.

Q. How do advancement opportunities for technical graduates stack-up with those of other graduates?

A. Very well. General Electric is recognized as a Company with outstanding technical skills and facilities. One out of every thirteen employees is a scientist or engineer. And approximately 50 per cent of our Department General Managers have technical backgrounds.

Q. How about speed of advancement? Is G.E. a “young man’s Company”?

A. Definitely. A majority of all supervisors, managers and outstanding individual contributors working in the engineering function are below the age of forty. We believe that a job should be one for which you are qualified, but above all it should be one that challenges your ability. As you master one job we feel that consideration should be given to moving you to a position of greater responsibility. This is working, for in the professional field, one out of four of our people are in positions of greater responsibility today than they were a year ago.

Q. Some men want to remain in a specialized technical job rather than go into managerial work. How does this affect their advancement?

A. At G.E. there are many paths which lead to higher positions of recognition and prestige. Every man is essentially free to select the course which best fits both his abilities and interests. Furthermore, he may modify that course if his interests change as his career progresses. Along any of these paths he may advance within the Company to very high levels of recognition and salary.

Q. What aids to advancement does General Electric provide?

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

If you have other questions or want information on our programs for technical graduates, write to E. G. Abbott, Section 959-9, General Electric Co., Schenectady 5, N. Y.

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