James Chisholm, class of '41, speaks from experience when he says,

"Men with ability and ambition really have a chance to get ahead at U.S. Steel"

A responsible position can come quickly to those graduate engineers at U.S. Steel who show ability and ambition. Management training programs are designed to stimulate and develop these qualities as the trainee "learns by doing." His training is always a fascinating challenge and he works with the best equipment and the finest people in the business.

James Chisholm is typical of the young men who rapidly rise to an important position at U.S. Steel. Jim came to U.S. Steel as a trainee in 1941 after graduating as an M.E. Shortly thereafter he entered military service for four years. Upon his return to U.S. Steel in 1946, he advanced steadily until, in 1951, he was appointed to his present position as Assistant Superintendent of Blast Furnaces at the new Fairless Works at Morrisville, Pa.

Jim is now in charge of the unloading of all ore ships and the operation of the plant's two big blast furnaces—each with a rated output of 1500 tons per day. Jim feels that the opportunities for graduate engineers are exceptional at U.S. Steel. He remarked that in his own department alone, six college trainees have been put into management positions within the last couple of years. He says that chances for advancement are even better now with the current expansion of facilities and the development of new products and markets.

If you are interested in a challenging and rewarding career with United States Steel, and feel that you can qualify, you can get details from your college placement director. And we will gladly send you a copy of our informative booklet, "Paths of Opportunity," which describes U.S. Steel and the openings in various scientific fields. Just write to United States Steel Corporation, Personnel Division, Room 1622, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL
More and better jobs for more people

GENERAL MOTORS President Harlow H. Curtice speaking:

"Just as an example of how job opportunities in General Motors have grown, here is what has happened since 1940.

"In 1940, we had 233 thousand employees on our payrolls in the United States and Canada. In 1955, our employment totals 520 thousand—an increase of 287 thousand good jobs in only 15 years."

It stands to reason that a climate where job opportunities expand with such rapidity must be especially fruitful of career opportunities for young men holding engineering degrees.

For, in the final analysis, the very life’s blood of our organization is the never-ending production of “more and better things for more people”—and that, very definitely, requires the engineering mind at its best.

In point of fact, although engineering graduates comprise a mere two per cent of total GM employment, they will eventually fill about forty per cent of executive posts if the established pattern continues.

Why not, then, look into the possibility of enjoying a rewarding career as a GM engineer? You’ll be interested in a big new 136-page handbook entitled, “Job Opportunities in General Motors.” Your college library or placement office should have it.

GM Positions Now Available
In These Fields:

MECHANICAL ENGINEERING
ELECTRICAL ENGINEERING
CHEMICAL ENGINEERING
METALLURGICAL ENGINEERING
INDUSTRIAL ENGINEERING

GENERAL MOTORS CORPORATION

Personnel Staff, Detroit 2, Michigan

May, 1955
NEW PRODUCT in the air conditioning field is Worthington's ultra-modern winter and summer home air conditioner. It's a compact package that heats, cools, circulates, filters, and controls humidity. Like every Worthington product, this good-looking unit is designed and built for a lifetime of quiet, efficient service.

Making today's BIG news in air conditioning

NEW BUILDING in New York is the glass-sheathed Manufacturer’s Trust Building. It's cooled by a Worthington central station system—so big it does the same job as melting 300 tons of ice daily.

NEW LIFE FOR OLD STORES. Shoppers stay longer, buy more in stores cooled by Worthington units with the new “Million Dollar” compressor. New 3-D circulation aims comfort right where you want it.

See the Worthington Corporation exhibit in New York City. A lively, informative display of product developments for industry, business and the home. Park Avenue and 40th Street.

Worthington's new residential air conditioners, packaged units, big central station systems—all are making headlines in the air conditioning field. And the same research and engineering skills responsible for their development are applied to all Worthington products—engines, turbines, compressors, construction machinery, as well as pumps.

For the complete story of how you can fit into the Worthington picture, write F. F. Thompson, Mgr., Personnel & Training, Worthington Corporation, Harrison, New Jersey.
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### The Cover

**The Cover**

THE DEMAS AND SARAH C. DEMING MEMORIAL DORMITORY, built in 1926 as the gift of the late Demas Deming, is located a short distance from the main building on a ridge overlooking the lake and the athletic field. It accommodates sixty students in residence besides furnishing cafeteria service at noon for the entire student body.

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**MAY, 1955**

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May we call attention to our Complete Printing Service

Rapid, accurate execution of your printing requirements at reasonable prices.

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Page 4

The Rose Technic

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The Rose Technic
HIGH SCHOOL GRADUATES OF 1955

You are cordially invited to visit Rose Polytechnic Institute during the present school year to learn more about your college entrance and the highly accredited engineering courses available to you at Rose. The next freshman class will be admitted September 12, 1955.

OFFICE OF ADMISSIONS
ROSE POLYTECHNIC INSTITUTE
Terre Haute, Indiana

May, 1955
Engineers: join this winning team!

At DOUGLAS you’ll be joining a company in which the three top executive officers are engineers...you’ll be associated with men who have designed the key airplanes and missiles on the American scene today! Nothing increases an engineer’s ability faster than working with other engineers of top calibre.

Not only is Douglas the largest manufacturer of commercial aircraft in the world, but it also produces outstanding aircraft and missiles for every branch of the armed services! This diversity, besides giving you job security, provides unequalled opportunity for the engineer with an eye to the future.

Challenging opportunities now exist in the following fields:
- Mechanical design
- Structural design
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- Aerodynamics
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- Aircraft air conditioning
- Hydraulics
- Stress analysis
- Servo mechanisms
- Acoustics
- Electronics
- Mechanical test
- Structural test
- Flight test
- Process engineering
- Missiles

Brochures and employment applications are available at your college placement office.

For further information relative to employment opportunities at the Santa Monica, El Segundo and Long Beach, California divisions and the Tulsa, Oklahoma division, write today to:

DOUGLAS AIRCRAFT COMPANY, INC.
C. C. LaVene, Employment Manager...Engineering General Office
3000 Ocean Park Blvd....Santa Monica, California
To help develop Sta-Clean for Standard Furnace Oil, the testing apparatus shown here was constructed. Running an experiment on the improved oil is Dr. Jack A. Williams, a chemist at Standard Oil’s Whiting laboratories.

HOW TO SOLVE A BURNING PROBLEM!

Scientists in Standard Oil laboratories work with the stimulating knowledge that practical and valuable results will be obtained from their discoveries. A recent achievement of Standard Oil scientists is now benefiting hundreds of thousands of Standard Furnace Oil users throughout the Midwest.

In 1952 our research people undertook the problem of finding a method to eliminate oil burner failure or inefficiency arising from clogged filters and burner nozzles.

After months of painstaking laboratory work and many more months of thorough field testing throughout an entire heating season, Standard Oil scientists perfected a new, efficient additive—Sta-Clean. Blended into our furnace oil, the new additive acts as a detergent, sludge inhibitor and rust stopper—all in one. Sta-Clean assures clean filters and nozzles—a dramatic contribution to efficient and economical heating.

The development of this remarkable new additive is further proof of the progress possible when scientists are given time and equipment to explore and develop thoroughly their ideas. Young scientists find such an atmosphere inspiring.

Standard Oil Company
910 South Michigan Avenue, Chicago 80, Illinois

May, 1955
Several things which have affected and will continue to affect the life of the student are in the offing here at Rose. Let’s take a look at some of these.

In September Saturday classes were initiated to the curricula making five and one-half days spent in classes or in labs each week. This causes some hardships to faculty and students alike. Some have expressed the feeling that it wasn’t worth driving twenty miles for two hours of Saturday class. It might be better for the students and the faculty to stay two nights from four to five o’clock rather than come to school on Saturday.

Food has also been a common complaint heard by the dormitory residents during the past school year.

This will be remedied when the new cafeteria is built. This will be accomplished by gutting the present cafeteria, enlarging the seating capacity and moving the kitchen further back than it is already.

The furniture in the cafeteria will be new, and better seating schemes will be made. The kitchen will be completely renovated and will contain all new cooking equipment replacing the outdated equipment now in use. If the food doesn’t taste good next year, it can’t be blamed on poor equipment.

A new dormitory will also be constructed to house the new students and those now quartered in the temporary buildings. It will be located at the east end of the smaller lake.

The construction on this dormitory will begin immediately after Commencement. During the construction it will be necessary to remove only one of the temporary buildings; however, after construction is finished, the remainder of the temporary housing units will be removed.

This new dormitory will house 132 men, and in addition it will have a small wing for the dormitory supervisors, Professor and Mrs. Ross. It is hoped that the cornerstone can be laid during Homecoming on October 8.

These improvements have come thru the bequests and large gifts by and in memory of Charles F. Sames, 1886; Oscar Baur, 1887; and Bruce F. Failey, 1889. This in itself shows the spirit of Rose grads.

This school year has been certainly one to remember, and the coming year one to look forward to.

C.R.H.
In the thickly populated 1630 square miles of the Los Angeles Basin smog is both the current No. 1 economic problem and the chief irritant to 5,000,000 people.

It is also a fighting word, a platform for political campaigns, a gag on radio and TV — and a very serious threat indeed to the continued growth of the entire Los Angeles area.

Smog is defined as the eye-irritating, acrid substances that cause vast discomfort to humans and damage to plant life.

What is responsible for this apparent anomaly, no one yet knows. It is one of the big questions being investigated by the Air Pollution Foundation and other governmental and scientific agencies engaged in smog research. When the answer is found, the first phase in the fight to eradicate smog will be over.

Although the exact components of smog remain obscure, the authorities are clear that it results from a combination of man's actions and nature's meteorological and geographical caprices.

Man with his industries, automobiles, busses, trucks, and incinerators provides much of the raw material out of which smog presumably evolves. These are mainly hydrocarbons, combustion products, and other vapors. Nature inadvertently contributes to the problem an "upside-down atmosphere" in the Basin, a mountain barrier on three sides and low average winds off the Pacific Ocean. All of these factors reduce ventilation in the area to a minimum and make it a definite incubator for smog.

Even California's famous sunshine must share responsibility for the menace, because it energizes chemical reactions in the air. The scientists are checking Old Sol's connection with the matter closely and are expected in the not too distant future to come up with a statement on the sun's probable part in creating smog.

Sprawled in the Los Angeles Basin is a great agricultural industry, the world's center of motion picture making, vast oil refineries, steel, rubber, and aircraft plants, a large seafood industry, soap and chemical plants, and literally thousands of other industries employing many hundreds of thousands of persons. Individually, many of these contribute much to air pollution, and therefore to smog.

Smog today is a much discussed subject not only in the Los Angeles Basin and in California, but throughout the world. People living in other parts of the country may become hesitant about visiting or moving to Los Angeles because of smog's alleged harmful influence on health. Industries contemplating moving their plants to the Los Angeles area may hold off until they learn more about what causes smog and how and when the situation can be remedied.

Up to now the chemical nature of smog has baffled scientific investigators. The best known theory today is that smog is the result of photochemical reactions involving hydrocarbons, oxides of nitrogen, and sunshine. However, much additional research is needed to find out if a host of other organic compounds in the atmosphere are involved, their sources and the exact nature of their reactions.

It is known that the presence of smog is signaled by irritation of the eyes and respiratory tract sometimes accompanied, during severe attacks, by nausea or mental depression. Beyond this, the physiological effects of smog on humans are largely unknown, despite various and conflicting claims to the contrary.

The Los Angeles Basin is a natural atmospheric "trap" because of its geographical location and peculiar meteorological conditions. It is a low, flat, expansive valley generally surrounded on the north and east...
by mountains. Prevailing winds are from the west, thus blowing toward the mountains.

During much of the year a temperature inversion prevails over the Basin. A temperature inversion is a condition in which warm air is present over cooler air, acting as a lid.

Inasmuch as cold air will not rise through warm air, all air pollutants discharged into the cooler air are held near the earth, thus preventing air pollutants from escaping upward. The mountains surrounding Los Angeles Basin combine with the light winds to prevent horizontal spreading. When the inversion is at a low level, pollutants are more concentrated and, therefore, more likely to form eye irritants and oxidants, to damage plants and to reduce visibility.

Sources of smog in the Los Angeles Basin include a great variety of contributing materials, and it is this variety that has made it extremely difficult to point to single causes. The contributing materials are believed to contain some components of all the gases, liquids, and solids found in man's environment, natural or manufactured.

Research so far indicates that about 60,000 tons of various materials are burned each day throughout the Basin, and it is generally agreed that incomplete combustion of these materials results in over 3,000 tons of air pollutants being discharged daily into the air.

The main materials burned in the Basin are natural gas, fuel oil, gasoline, and rubbish. More than 80 percent of Los Angeles' supposedly significant air pollution thus far identified is the result of incomplete combustion of these materials. It is generally agreed that the three chief contributors are motor vehicles, industry, and rubbish burning, in that order.

It is estimated that more than 15,000,000 pounds of combustible refuse is burned each day in the Los Angeles Basin, resulting in more than 1,000,000 pounds of unnecessary air pollutants. A large part of this is still burned in so-called backyard incinerators. These incinerators are looked upon as definite suspects in the smog lineup of culprits. It has been suggested that incinerators be replaced by sanitary and efficient collection systems, with final disposal made to local landfills when available, or distant landfills when necessary.

These are the major factors presently believed to contribute to smog. There are many more that may become more or less important as research continues and their secrets are revealed. How long this will take and how much money it will cost no one knows.

Regarding cost, the Los Angeles area has spent several billions of dollars for highways, $750,000,000 on its water supply, and $300,000 on its sewer system. It is believed that the community ultimately may have to spend some comparable amount for clean air.

Only a start has thus far been made in licking smog; and yet, currently this area, through its several agencies, public and private, has under way the most extensive research program into the causes and effects of air pollution ever undertaken anywhere in the world. The Air Pollution Foundation is contributing increasingly to this effort. It is presently conducting, both in California and throughout the nation, a total of 46 separate research projects aimed at the reduction of air pollutants.

Volunteer Cry Baby . . . .
On April 18th, the world paid its final respects to a quiet individualist whose genius had remolded many of the basic concepts of physical science. Dr. Albert Einstein, master physicist and practising humanitarian was dead. In the course of history there have been but a handful of men whose achievements have marked a milestone in the growth of man’s knowledge. Albert Einstein was one such man.

He was born on March 14, 1879, at Ulm, a small city in the Swabian part of Bavaria. A year later his family moved to Munich where Einstein’s father set up a small factory for the manufacture of electrical supplies.

Shortly thereafter a younger sister was born to complete the family circle.

Einstein was in no sense a child prodigy. In fact he was so tardy in learning to speak that his parents were afraid that he was abnormal. Throughout his childhood his mannerisms were slow and deliberate. In elementary school he remained aloof from the other children, refusing especially to enter into group activities. At the age of ten he entered the Luitpold Gymnasium in Munich, a typical German secondary school incorporating strict, almost militaristic discipline. Oppressed by what he termed in later life the “educational machine,” Einstein displayed a passive contempt which irritated many of his instructors. Finally at fifteen he was requested to leave the institute after being told, “Your presence in the class destroys the respect of the students.”

Embittered by his dismissal from the gymnasium, he obtained permission from his father to renounce his German citizenship and finish his secondary schooling in Switzerland. Though he had, by this time, displayed a definite gift for mathematics, he soon found that his chief interests lay in the physical sciences. Therefore, upon graduation he entered the Swiss Federal Polytechnic at Zurich and embarked upon a physics-mathematics teaching curriculum.

Einstein’s chief goal while at Zurich was to secure a teaching position at the Polytechnic. It was a bitter disappointment, therefore, when the very professors who consistently praised his undergraduate work later refused without explanation to hire him as an assistant. He soon discovered that none of the institutions to which he made application were interested in his services. For the first time in his life, Albert Einstein had been made to feel the impact of National and racial prejudice.

Despite this early setback, the following year (1901) Einstein became a Swiss citizen. Through the aid of a friend at the Polytechnic he secured a job as patents inspector at the Federal Office of Patents in Bern, Switzerland. Soon after his arrival in Bern, he married Mileva Maric whom he had met while a student at the Polytechnic. She, too, was a physicist and like Einstein was independent and progressive in her ideas. The couple had two sons in rapid succession, naming the eldest Albert after his father.

It was during his employment at the patents office that Einstein’s creative genius first came to light. From the year of his graduation he had published one article each year in a special German periodical entitled Year Book of Physics. In 1905 this publication contained five contributions from him, including his first paper on the now famous relativity principle. Briefly, this paper contained two important postulates.

1. The physical law which governs two systems in uniform relative motion are identical.
2. The velocity of light is constant and independent of the (uniform) relative motion between systems.

In stating these assumptions, Einstein had both openly defied a popular
belief in the existence of a rest “ether” system and contradicted Newton’s basic law of addition of velocities. He utilized his new theory in another short paper to show that mass and energy were actually one and the same (E=mc²) and to indicate thereby that the development of atomic energy was theoretically possible.

While the physical world was not prone to accept Einstein’s “unusual” theories, at least it was jolted into the realization that such reasoning was incompatible with the work of a mere patents inspector. Einstein was immediately advised by his former professors at Zurich to prepare himself for a professorship by lecturing at the university of Bern. This he did and, in 1909, he was appointed “professor extraordinary” at the University of Zurich. In 1910 he was appointed to a full professorship at the German University in Prague. Two years later he returned to Zurich as pride of the institution which had once refused him even a minor position.

By this time the first relativity principle regarding systems in uniform motion had gained some recognition. Einstein, however, had already shown indication of expanding his theory to include “accelerated systems. In a paper published in 1911, he theorized that light is bent under the influence of a gravitational field, and presented calculations to indicate the extent of this phenomena. (These calculations were not exactly correct.) He concluded the paper with a challenge to astronomers to test his prediction experimentally.

In 1913 two of Germany’s leading physicists, Max Planck and Walter Nunst, were instrumental in bringing Einstein to Berlin as director of a proposed laboratory for physical research at the Kaiser Wilhelm Institute. He was also elected to membership in the coveted Prussian Academy of Science, Europe’s most outstanding intellectual society. Shortly thereafter, his wife, Mileva, with whom in many respects he was no longer in accord, obtained a separation. Einstein did not remain a bachelor for long however. Upon visiting his uncle in Berlin, he found that his cousin Elsa, whom he had not seen since leaving Munich, was now a widow with two daughters. Elsa proved to be a friendly, maternal companion. Thus it was that Einstein again married and settled into a new family life.

In 1916, he published his “general theory of relativity” in which a clean departure was made from Newtonian mechanics. In the latter, accelerated motion, as produced by the action of a given force, is inversely proportional to the “mass” of the accelerated body. Einstein contended that gravitation and acceleration have the same effect. Since all bodies in a gravitational field are acted upon identically, he argued that the motion of these bodies must be described in purely geometrical terms as opposed to a non-geometrical “mass”. He indicated, however, that Euclidean geometry could not be utilized in this instance due to the curvature of space within the gravitational field. Thus, the motion of a body (or light) within the field must be described in terms of geodesic lines of the curved space. On the basis of his new concept of the curvature of space, Einstein recalculated the deflection of light as presented in his 1911 paper and arrived at a prediction of 1.75 seconds of an arc. Three years later the experiment which he had previously suggested was actually conducted, yielding an arc deflection of 1.64 seconds. It was a dramatic triumph for the new Einstein mechanics.

Almost overnight Einstein found himself an international figure. He was invited to lecture in universities throughout the world. Thus, for the next five years, most of his time was spent abroad. Aware of the significance of his position, he tried to utilize it to throw light on some of the ills of humanity. He became an active participant in the rising Zionist movement and, for a time, was a member of the Committee of Intellectual Co-operation of the League of Nations. However, it soon became apparent that the newly formed League was little more than a tool in the hands of the major powers. Einstein subsequently resigned. In 1929 when the cornerstone was laid for the League Palace, he bitterly suggested that the inscription should read, “I support the strong and reduce the weak to silence, without bloodshed.”

From the time of its introduction, the relatively principle had been the subject of considerable controversy. This was especially true in the case of the general theory. So strong was the debate on this subject that the Swedish Academy of Science, in awarding Einstein the Nobel Prize in 1922, made no mention of relativity. Instead he was honored for his development of the “photoelectric law” published in 1905.

Einstein was constantly besieged by newspapers and popular periodicals to write for them a short description of his theory of relativity “in terms the public can understand.” On one such occasion he concluded an article for the London Times with the following illustration:

Today I am considered in Germany as a German scientist and in England as a Swiss Jew, but if one day I become persona non grata I would be a Swiss Jew for the Germans and a German scientist for the English.

This bit of cynicism was destined to come true sooner than Einstein might have anticipated. As a result of his affiliation with the Zionist movement, he had made numerous enemies in Germany. Thus when Hitler became chancellor in January, 1933, Einstein’s position as an important Jewish intellectual was immediately precarious. Fortunately, he nor his family were in Germany at the time. Without returning, Einstein resigned from his position at the Prussian Academy (merely to save Planck, the Academy’s director, from the embarrassment of expelling him), and took up residence in Belgium. This proved a wise decision, for within the month Einstein’s works had been branded as “expressions of Jewish mentality” and publicly burned in Germany.

Only a few years prior to this, the (Concluded on page 26)
Low-Power Transistorized Automobile Radio
Developed by RCA Scientists

An experimental transistorized automobile radio that operates directly from a 6-volt car battery and requires only about one-tenth of the power used by a conventional car radio was described here today by scientists of the Radio Corporation of America.

The new radio, employing nine transistors in place of electron tubes, is equal in performance to standard car radios, the RCA scientists aid. Emphasizing its low power consumption, they pointed out that more than half the small amount of current required by the radio is used to light the two small pilot lights that illuminate its dial. A radio of this type, they said, would create so little drain on a car battery that it could eliminate many cases of battery failure that now occur when a driver forgets to turn off the radio when he parks his car.

The radio has been tested at Princeton with a 6-volt battery as its power source. It is also adaptable to installation in automobiles with 12-volt batteries, the RCA team said. With a 12-volt power supply, they added, the power output of the radio would be more than doubled, since it is not limited by the capabilities of the transistors.

While the experimental radio resembles present car radios in its external appearance, the scientists said, it requires no vibrator, power transformer, or rectifier—elements needed in vacuum-tube car radios to increase and control the power level.

They also emphasized that the transistorized radio maintains a high level of performance over the widest range of temperatures likely to be encountered in automobile service. In laboratory tests, it has performed satisfactorily at temperatures as low as —40°F. and as high as 176°F., they said.

Westinghouse Operates New Metals Testing Chamber At 452 Degrees Below Zero

Metallurgists at the Research Laboratories of Westinghouse Electric Corporation are conducting tensile tests on metals at temperatures as low as minus 452 degrees Fahrenheit. The metal specimens are stressed within a specially designed chamber which has been cooled with liquid helium. Results of these tests will provide engineers with needed information regarding types of metals that are best suited for use under extreme temperature ranges. Information of this sort may well be useful in the design and development of guided missiles and future supersonic aircraft.

"It is not at all impossible," E. T. Wessel, research engineer or Westinghouse, explained, "that aircraft of the future will use fuels that are stored as liquefied gases in metal containers at extremely low temperatures. Preliminary studies of the properties of metals at low temperatures will be essential to developments of this kind."

Oxygen for human consumption during high altitude aircraft operation already is being stored in liquid form in metal containers at temperatures of about minus 300 degrees. This arrangement is more practical than using compressed gas since an equivalent size storage space contains a much larger supply of oxygen in liquid form.

Although much larger testing apparatus has been used in low temperature experiments in the past, the Westinghouse-developed chamber, which is only slightly larger than a hand fire extinguisher, is believed to be the first of its kind to use liquid helium in order to attain the minus 452 degree mark for purposes of tension testing. Prior to use of liquid helium as refrigerant, tests were conducted at temperatures as low as minus 320 degrees Fahrenheit using liquid nitrogen.

The new testing temperature of minus 450 degrees is just short of absolute zero or minus 459.6 degrees Fahrenheit, the point at which, theoretically, all molecular motion ceases. The aims of these ultra sub-zero investigations are concerned with obtaining a better understanding of the strength of metals and the factors that cause embrittlement failures. For example, normal grades of steel become brittle and rubber lose its elasticity when subjected to these extremely low temperatures.

Operation of The Cold Test Chamber

A sample of the metal to be tested, about one inch long, and 1/4 of an inch in diameter, is placed inside the special vacuum insulated chamber.

(Continued on page 22)
"This is what I did yesterday"

“I like a job that keeps me jumping,” says Bill Jermain, C.E. from Marquette, ’52. “And my first management assignment with Wisconsin Telephone Company does just that. I’m Service Foreman at Sheboygan, with nine installers, and that means variety of responsibility. But judge for yourself. Here’s a quick run-down of what I did yesterday, on a typical day—

8:10—“Checked day’s work schedule. One of my new men was putting in a buried service wire, and I went over the job specs with him to be sure he had things straight.

8:30—“Answered mail while my clerk checked time sheets from previous day.

9:30—“Out to supervise installation of the first aluminum Outdoor Telephone Booth in my exchange. Reviewed the assembly instructions with the installers, then arranged for special tools and bolts to be delivered to the job.

11:30—“Drove across town. Made a ‘quality inspection’ on a telephone installed last week. Everything checked O.K.

12:00—“Lunch.

1:00—“Picked up film for next day’s safety meeting. Watched the film, made notes for discussion.

2:00—“Met with moving company manager to estimate cost of telephone cable lifting for a house moving job. Drove the route he had planned and worked out schedule for construction crews.

3:30—“Returned to aluminum booth installation. Went over wiring specs with the electrician.

4:00—“Stopped at Central Office to pick up next day’s orders. Met installers at garage as they checked in and assigned next day’s work.”

Bill has been in his present job about a year, and is looking forward to new responsibilities as his experience increases . . . as are the many young college men who have chosen telephone careers. If you’d be interested in a similar opportunity with a Bell Telephone Company . . . or with Bell Telephone Laboratories, Western Electric or Sandia Corporation . . . see your Placement Officer for full details.
EDITOR'S NOTE: On May 6, 1955, just before this issue went to press, Col. Marvin L. Jacobs was promoted to full colonel. The students wish to congratulate Col. Jacobs on his promotion and wish him the best wherever he may go.

When September rolls around again, the students at Rose will miss some now familiar faces. Lt. Col. Jacobs, who has been at Rose for some four years now, is being transferred, and Mr. Frank Gutherie is taking a leave of absence to continue work on his Ph.D.

Col. Jacobs was born and raised in Hagerstown, Md., where he graduated from high school in 1933. He received his appointment to the U.S. Military Academy in 1936 and received his bachelor's degree in 1940. Col. Jacobs was commissioned on June 11, 1940, and served with 89th and 29th Infantry divisions in Holland and Germany during World War II.

After the war, he received his M.S. in engineering from the University of Illinois, and served as a military assistant to the governor of the Panama Canal Zone. Col. Jacobs served in this position until he came to Rose in 1952. Col. Jacobs informs us that he does not yet know where his next position will be, but that he regrets to leave and has enjoyed his stay at Rose.

We have received word that Lt. Col. Clifford E. Cross, who is presently serving with the 998th Engineering Aviation Brigade at Walters A.F.B., Texas, has been nominated to fill the vacancy left by Col. Jacobs.

Mr. Frank Guthrie plans a wedding, among other things, before returning to Rose a year from September. The bride-to-be is Miss Marcella Farrar, presently of LaPorte, Indiana. Mr. Guthrie will also continue work on his doctorate at Indiana University where he will be working on a research assistantship with Dr. Ward B. Schaap. His research will be in the field of analytical chemistry, which he has been working in the last two summers. Miss Farrar is also a teacher. She is presently teaching at LaPorte, and plans to begin work on her masters soon. Mr. Guthrie informs us that the wedding will take place on June 12th at LaPorte, all students and faculty are invited.
A CENTURY AGO, pioneering scientists learned to take apart water, air, and earth and put them together again ... in completely different arrangements.

THE RESULT, very often, was a synthetic—a brand new material that didn’t exist in nature, or a more abundant, more useful version of a nature-made product. Thus, through the years, synthetic has come to mean ‘man-made and well-made.’

Science has developed nearly half a million synthetic materials since that time, and millions more are possible.

WHERE DO SYNTHETICS fit into your life? Nearly everywhere! The aspirin you take for a headache, the life-saving sulfa drugs and scores of other modern medicines are synthetics. So are today’s remarkable plastics, new textiles, and many paints, dyes, adhesives, and valuable chemicals.

AN IMPORTANT PART of the work of the people of Union Carbide is discovering and producing synthetic materials that serve you and industry. From natural gas and oil, alone, they produce nearly 400 chemicals. Among them are chemicals that are vital to everything from synthetic rubber to cosmetics ... and to the variety of plastics and resins made by UCC, which are used in nearly every home and industry today.

STUDENTS AND STUDENT ADVISERS: Learn more about career opportunities with Union Carbide in ALLOYS, CARBONS, CHEMICALS, GASES, and PLASTICS. Write for booklet C-2.

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Eveready Flashlights and Batteries
Haynes Stellite Alloys
National Carbons

Prest-O-Lite Acetylene
Union Carbide
Acheson Electrodes
Pyrofax Gas

Page 17
We have recently acquired a reference work of which we are justly proud. It is *A Dictionary of Americanisms*, which presents for the first time the distinctive contributions Americans have made to the English language.

Two basic kinds of words and expressions make up this linguistic history of the United States. First, there are those words and phrases that made their entry into the English language in America. They range from names of uniquely American plants and animals, such as "hickory" and "racoon," and American inventions — "linotype" is an example — to such terms as the epithet "Babbitt."

Second, there are words and phrases that are old in the English language but that have taken on new meanings in America. For instance the term "Argonaut" came to mean one who went to California to hunt gold soon after its discovery there in 1848, and the word "addition" came to mean an extension of a city or town.

You will want to browse through this thoroughly interesting, strictly American dictionary.

Clear Channels, by Max Wylie.

An ounce of television appears to provoke a pound of criticism—printed, spoken, and often simply decried. There is plenty of sound and fury in the controversy, but Max Wylie has had the happy thought of adding some sense to the uproar. Frankly irked by the incomplete thinking and unproved charges of television's detractors, he takes a long and steady look at the facts, which he uses as ammunition for the well-aimed broadsides contained in many of his chapters. He scores direct hits on many vulnerable artas of faulty thinking. On the other hand, he is frank to admit that all is not irrefutable behind the camera lenses, and that television needs to keep its own house in better order than it has to date.

One refreshing aspect of this book is that its author is a practical and experienced man, with more than two decades of background as a radio and television writer, advertising executive, and college teacher. He writes of our actual experience acquired at first hand. He has, too, the knack of looking at something for what it really is, instead of what it is alleged to belong, a gift which makes his pages entertaining as well as useful.

Big Dam Foolishness, by Elmer Peterson

The Army Engineers are presently engaged in remaking the face of our land by means of a series of huge dams. It is estimated that the final cost of these dams may exceed 750 billion dollars!

Even more important to many of us is the destroying and taking out of production of hundreds of thousands of our most fruitful farm-land acres, plus an equal area of our best hunting and fishing grounds. Even our famous National Parks are endangered by this "supercolossal" program.

Elmer Peterson shows that the whole program is a stupendous waste of tax-payers' money and the biggest "pork barrel" undertaking in our history. Flood control can best be accomplished, he says, by keeping water where it falls. This is the program advocated by our Soil Conservation Service, and the only one that will work. The big dams are silt catchers and will be useless in 50 years.

A controversial, hard-hitting report.

The Human Brain, by John Pfeiffer

The human brain, three pounds of a pinkish-gray mass about the size of a soft ball, is the most complex structure we know in the universe. John Pfeiffer, well known for his fascinating and authoritative writing on scientific and medical subjects, now tells its story, describing both the complicated physical mechanism of the brain and that mysterious thing called "mind," the extraordinarily subtle organ which guides our lives and makes us behave like human beings.

What is memory? What is pain? Why do we need sleep? What are dreams? How do we think? How does the brain age? Why do we need sleep? What are dreams? How does the brain age? What is mental illness? All these questions, and many others, are answered in this penetrating account of the human brain from the first formation of brain tissue "when you are minus eight and a half months old and about one-twenty-fifth of an inch tall," to death, through the crises that living and aging, accident and disease, impress upon the brain.

We read of the brain's development and operation, of what happens when it finds itself in trouble, or therapy and treatment for disorders of the brain including psychiatric, chemical, electrical and surgical methods; and, finally, Mr. Pfeiffer tells us about the wonders of the new "thinking machines," the electronic brains which the human brain has begun to devise.
This picture shows how RCA helps small manufacturers grow

Today the inter-dependence between manufacturer and supplier is stronger than ever in the history of American business. For in the challenging new age of electronics, hundreds upon hundreds of component parts are needed in the manufacture of new products.

For example, the superb new RCA Victor 21-inch color TV set shown here contains 2,070 parts. These are made by 600 different suppliers, most of whom are small businesses.

Indeed, more than three-quarters of all RCA suppliers are small business firms that receive nearly one-half of RCA's purchasing dollars. They, in turn, have their suppliers of raw materials. Thus through a long line of cooperative effort, employment is provided for countless people in many fields—and an entire economy benefits.

RCA salutes its full roster of 7,500 suppliers, located in 43 states, for their inventiveness and resourcefulness that contribute so much to the quality and performance of its products. With these firms at our side, RCA continues to march forward, creating new and better "Electronics for Living"—electronics that make life easier, safer, happier.

WHERE TO, MR. ENGINEER?
RCA offers careers in research, development, design, and manufacturing for engineers with Bachelor or advanced degrees in E.E., M.E. or Physics. For full information, write to: Mr. Robert Haklisch, Manager, College Relations, Radio Corporation of America, Camden 2, N. J.

RADIO CORPORATION OF AMERICA
ELECTRONICS FOR LIVING

May, 1955
Sigma Nu

Sigma Nu has recently elected its new officers for the coming year. They are George T. Rezek, Commander; Myron J. Clark, Lt. Commander; Richard Hirst, Recorder; Harry McGuire, Asst. Treasurer; David Moeller, Chaplain; Richard Light, Sentinel; Robert N. Woldstad, Marshall; George South, Reporter; Owen March, Alumni Contact Officer; and Ken Cross, Historian. Ray Fischer was also appointed as Social Chairman. We wish them success in their new offices.

Our pledge class has been strengthened by the pledging of Arthur T. Clark of Caldwell, N. J.

Sigma Nu regrets to announce the death of David Peter who passed away at a Cleveland hospital on Saturday, April 23, 1955. We all realize that he was one of the finest pledges in this year’s pledge class.

Through the good pitching of “Candy arm” Hartley and John Rhodhamel, Sigma Nu has a record of 3-1 in the Inter-fraternity Softball League. We are hoping to come through and win the rest of our games.

A cocktail party was held at the house for the actives, pledges and their dates, before the Interfraternity Dance, which was attended by over 20 couples. Ken Cross did a swell job in getting our scrapbook ready for the party.

Congratulations to Alpha Tau Omega for their fine job in winning the Interfraternity Song Contest for the third straight year.

A picnic with Alpha Omicron Pi was planned this month in appreciation for the help that they gave us for our Rush Activities this year.

Congratulations are in order for Jerry Hebb, our past-Commander, who has announced his engagement and coming marriage to Miss Suzanne Jones on June 13, 1955.

George B. South, Jr.

Theta Xi

Last month proved to be a full month for the men of Theta Xi. Ted Solmundson, Bill Waggner and Gene Mrava represented the Rose chapter of Theta Xi at a regional convention at Ohio State on April second. Five of the country’s largest schools (all big ten) and Rose got together for a confab.

The annual Bowery Ball was held on April 16, 1955. Our genial chaperones were Major and Mrs. Howell and Captain and Mrs. Bernstein. Colonel Jacobs was our honored guest. Don Lazzell and his combo provided the music and Gene Stoker the thrills, as he won the best costume contest.

On April 30, 1955, Kappa of Theta Xi sent a large representation to the Warren hotel in Indianapolis for Founder’s Day festivities.

On May 6, at the I-F dance the men of TX even tried testing their vocal chords. The songs were in a different vein than usual.

Gene Mrava

Lambda Chi Alpha

Theta Kappa’s year came to a climax socially with the Interfraternity Dance on May sixth. A dinner was held at the house for the brothers and their dates before the dance, and a party afterwards. Congratulations to Frank Eppert and all the ATO’s for a fine job of singing at the dance, and thanks to song leader George Ross, who spent a great deal of time, and did a wonderful job for Lambda Chi.

At the end of another successful inter-fraternity softball season, Lambda Chi is looking forward to its third straight championship. The team now holds double wins over ATO and Theta Xi, and one victory over Sigma Nu. Only one game with Sigma Nu remains to be won for a third straight undefeated season. The seniors who will be playing their last game include Sam Hart, Lou Hege- man, Don Snape, George Ross, Larry Samuels, Bud Hall, and Dick Gordon.

Our congratulations go to Lou Hegeman and Walt Johanningsmeier, who were recently initiated into Tau Beta Pi, and to Terrell Vanover, who was initiated into Blue Key.

Jack Shumate.

Alpha Tau Omega

The Interfraternity dance held Friday, May 6, in the Rose Auditorium highlighted the fast closing fraternity year. First place in the annual I. F. Sing went to the Taus for the third straight year making the accompanying plaque a permanent trophy for the living room. Brother Frank Eppert, Tau song director, directed the chapter singing.

“Oh, my land of liven” was the note of surprise from Mrs. Srote, our house mother, when she walked into a surprise birthday party given for her at the house on Friday evening, April 29. Along with the presents from her close friends was an Elgin watch from the chapter. Also presented to her was a certificate of commendation from the national office of the fraternity.

The theme for the pledge dance held April 30 was “Bermuda”. The Three Teens Combo furnished the rhythm as the breezes blew on knees left bare by Bermuda shorts. Initiation for the pledge class was held Sunday, May 22.

Help Day for the four Rose fraternities was held May 15 this year. A group of twenty Taus helped with the other three frats in a city wide collection of articles for the Good Will Industries.

The Board of directors for Province Seventeen announced that senior John Gregory was the recipient of the Thomas Arkal Clark Award for being the outstanding student of the seven chapters in this Province. John is the first chapter member to receive this award since 1946 and we wish him the best of luck in the National awarding.

Jack Hills.
Cliff Litherland asks:

Would I have varied assignments at Du Pont—or would I specialize technically?

CLIFFORD LITHERLAND received a B.A. degree from Rice Institute last year, and is now working for a B.S. in Chemical Engineering. He is Business Manager of "The Rice Engineer," and Vice-President of the fifth-year class at Rice. By asking questions of prospective employers, Cliff is trying to get information that will help him make the best use of his training in the years ahead.

ARTHUR I. MENDOLIA was graduated from Case Institute in June 1941 and started work with the Du Pont Company that same month. In addition to handling challenging assignments at work, he also enjoys some interesting hobbies. Although he makes no claims personally, he's classed as a minor authority on golf and hi-fi music. Mr. Mendolia is Assistant Director of Research for Du Pont's Electrochemicals Dept.

Well, Cliff, I'd say the answer to that question depends largely on your own preferences. In a company the size of Du Pont there are opportunities for growth along either line.

In my own case, I've followed the route of diversification—and I think you'll find that's the general procedure when a fellow is interested in administrative work.

For example, after graduation I started work in the research lab at Du Pont's Niagara Falls plant. That was followed by two years of process improvement work, and a stretch as assistant supervisor over one of the plant areas. Next, I spent a few years in liaison on the design and construction of our first full-scale plant for making nylon intermediates from furfural. Then, I had assignments on "plant start up," and production supervision before I was given my present post. I was made Assistant Director of Research for Du Pont's Electrochemicals Department last August.

You see, variety of assignments means contact with new men and with constantly changing problems. That keeps interest alive. It leads to growth, too, because it provides a broad base of experience for future responsibilities.

On the other hand, some fellows prefer to become specialists in a particular field—and Du Pont has many opportunities for that type of professional growth, too. In our research, development and design groups we have experts on distillation, mass transfer, thermodynamics—and most anything else you'd care to mention in the field of engineering. These men are respected throughout the whole company for their technical knowledge.

Whichever route you choose, Cliff—broad or specialized—you'll find that a job well done leads to satisfaction and advancement at Du Pont.
ber. The sample is held securely at each end in special chucks made of Discaloy, an alloy developed several years ago by Westinghouse to withstand high temperatures and high stresses for extended periods of time. Liquid nitrogen is used for initial cooling of the chamber from room temperature to minus 320 degrees. At this point liquid helium is introduced to take the temperature down to minus 452.

Nitrogen is used in the room temperature to minus 320-degree range because it is considerably more economical and efficient than is the use of helium at these temperatures. Using these two refrigerants, tests can be conducted at any temperature from zero to minus 452 degrees Fahrenheit.

When chamber and test sample are stabilized at the desired temperature, a tension load is applied to the sample and is gradually increased until the piece of metal breaks. During the test the temperature of the metal specimen and also the stress-strain readings from the sample are recorded electrically on graphic charts. In current experiments, the maximum stress that can be applied to the 1/4 inch diameter sample is 260,000 pounds per square inch.

In addition to providing basic engineering data necessary to the development of such things as low temperature liquid fuel and coolant storage tanks for guided missiles, Mr. Wessel said the studies will improve our understanding of why metals behave as they do under various conditions. The fact that low temperature liquids are being considered for coolants in guided missiles was disclosed in September, 1954, in Boulder, Colorado, at the dedication of the new National Bureau of Standards Laboratories there.

New Valves
Last Longer

Automotive engine value life can be doubled with a new aluminum coating technique reported by General Motors to the Society of Automotive Engineers.

The report was presented today at the SAE midwinter meeting by Dr. R. F. Thomson (correct) and D. K. Hanink of General Motors Research Laboratories Division, E. B. Etchells of Chevrolet Division and K. B. Valentine of Pontiac Motor Division.

They explained how the so-called Aldip process has been applied successfully to automotive engine intake and exhaust valves.

Aldip was developed by GM Research Laboratories to protect steel parts against oxidation and corrosion, especially at high temperatures. It has been used on exhaust manifolds, heat exchangers and turbine engine components with great success.

Use of Aldip on engine poppet valves, however, is the first application to moving parts of an engine.

The report described two general methods for applying an aluminum coating to a steel part.

The original method, especially adapted to coating intricately shaped parts, is to preheat the part in a special patented salt flux and then dip it in molten aluminum. Excess aluminum clinging to the part after the dip is blown, spun or shaken off.

A newer method eliminates the dipping operation. Aluminum is sprayed onto the steel part. Then the part is heated in the flux until the aluminum melts. This spray technique makes possible quick, even application of aluminum and is particularly well suited to coating engine valves.

In road tests reported by GM engineers, Aldip valves lasted more than twice as long as uncoated valves of the same steel composition.

(Continued on page 24)
How to increase gear life in a scraper

When this 13 cubic yard scraper, fully loaded, travels at 25 MPH over rough terrain, the gears in the differential, engine shaft and pinion get a workout. Realizing this, the engineers specified Timken® bearings for these vital applications. The tapered construction of Timken bearings lets them take radial and thrust loads in any combination. Gears are held rigidly in place. Perfect tooth-mesh is maintained. Gears last longer.

How TIMKEN® bearings hold gear shafts rigid

The line contact between rollers and races of Timken bearings gives shafts rigid support over a wide area. Shaft deflection is minimized. And the tapered design of Timken bearings permits them to be set up with the most desirable amount of end play or preload that gives the best performance.

Want to learn more about bearings or job opportunities?

Some of the engineering problems you'll face after graduation will involve bearing applications. For help in learning more about bearings, write for the 270-page General Information Manual on Timken bearings. And for information about the excellent job opportunities at the Timken Company, write for a copy of "This Is Timken". The Timken Roller Bearing Company, Canton 6, O.
MEN
of
ROSE

Remember the
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June 9
Give her a Corsage
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129 So. 7th St.
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Bring refreshment into play
have a Coke

Coca-Cola Bottling Co.
924 Lafayette Ave. Terre Haute, Ind.

Research & Development

(Continued from page 22)

By increasing a valve's resistance
to high temperature corrosion and
oxidation, the Aldip process creates
a better value without increasing
use of expensive, critical alloy met-
als.

The four GM spokesmen said the
secret of Aldip's protective ability
is the alloy formed just beneath the
surface.

RCA Experimental Battery Unit
Converts Atomic or
Light Radiation to Electricity

A tiny semiconductor device that
converts either light or atomic radi-
dation directly to usable electrical
energy was described here today by
scientists of the Radio Corporation
of America.

The device, a silicon junction
similar to those used in transistors
and in the RCA Atomic Battery,
has been employed in experimental
solar and atomic batteries at the
David Sarnoff Research Center of
RCA, Princeton, N. J. Using light
and radioactive material inter-
changeably as sources of radiation,
these batteries have powered a
specially designed low-power trans-
stORIZED radio receiver.

The versatile battery unit was
described in a progress report to
the Southern District, American
Institute of Electrical Engineers,
by a team of RCA scientists including
Dr. Ernest G. Linder, Paul Rapap-
ort, and Dr. J. J. Loferski. Dis-
cussing continuing RCA research
in methods of converting radiation
directly to electric power, the sci-
entists pointed out that batteries
capable of such conversion promise
to find important application in the
near future as sources of electricity
for low-power electronic equipment,
especially in the field of transistor-
ized devices.

Like the RCA Atomic Battery, the
unit in which radiation is converted
to electricity is a wafer of silicon
into which an impurity is alloyed
to form a junction, Dr. Linder said.
When the wafer is exposed to bom-
bardment either by beta particles
from a radioactive source or by pho-
tons of light, electrons are released
within the silicon. These electrons,
flowing across the junction, produce
a voltage that can be applied to a
circuit and cause a current to flow,
he said.

Units Connected in Series

The unit employed in the RCA
experiments is a junction about 1/4
inch in diameter and 1/100 inch
thick. To produce enough current
to operate a low-power radio, the
scientists said, several such units
have been connected in series and
operated with both atomic and light
radiation sources.

A low-power radio was designed
for tests with the batteries by Loy
E. Barton, of the technical staff at
the David Sarnoff Research Center.
It was described in the report as a
diode detector followed by three
transistor audio amplifiers feeding
into an earphone. Because of the
low available power from the bat-
terries, the radio used only 10
milliwatt's of a watt in operation, but
successfully picked up commercial
broadcasts at short range.

The radioactive source employed
in the experiments is strontium-90,
an atomic fission by-product used
also in the original RCA Atomic
Battery. When a radioactive source
is used, the report said, the junc-
tions are arranged around the
material so as to intercept as much
as possible of the radiation. In a
light battery, it added, the same
junctions are arranged to expose as
much surface as possible to the light
source. An experimental light bat-
tery having twelve silicon junctions
mounted in a Lucite case has oper-
ated the low-power radio in average
room light, the scientists said.

The report indicated that some
problems remain to be overcome in
order to achieve commercially prac-
tical atomic and light batteries. One
such problem in atomic batteries,
the scientists said, has been damage

(Concluded on page 30)
There's plenty of variety in Boeing engineering careers

America's pioneer passenger-cargo aircraft, the 40A, was a Boeing. So is the Air Force's versatile tanker-transport, the C-97 Stratofreighter shown above.

During the company's 38-year history, Boeing engineers have blazed new trails in the design of aerial freighters and tankers, commercial airliners, flying boats, fighters, trainers and bombers. Today Boeing continues to offer engineers a wide variety of opportunities in Research, Design and Production.

Students sometimes are surprised that Boeing's engineering staff includes those with civil, electrical, mechanical, aeronautical and other engineering degrees. Yet all find application in aviation. For example, the civil engineer may work on airframe structure or stress. Electrical engineers find challenge in the complicated electrical and electronic systems of modern jet bombers and guided missiles. Other engineers will find similar application for their talents.

The high degree of stability in careers at Boeing is reflected in this chart.

It shows that 46% of Boeing engineers have been with the company five or more years; 25% for 10 or more years, and 6% for 15 years.

Boeing promotes from within, holds regular merit reviews to assure individual recognition. Engineers are encouraged to take graduate studies while working and are reimbursed for all tuition expense.

Current Boeing programs include: six and eight jet bombers; America's first jet transport—the 707; F-99 Bomarc pilotless interceptor (guided missile)—and advanced projects such as the application of nuclear power to aircraft.

For further Boeing career information consult your Placement Office, or write: RAYMOND J. B. HOFFMAN, Admin. Engineer Boeing Airplane Company, Wichita, Kansas
first American institute comparable to the major intellectual centers of Europe had been erected at Princeton, New Jersey. Einstein, who had already agreed to spend a portion of his time each year at the new foundation, was now offered a permanent position. He accepted and in the winter of 1933 moved to Princeton to become a member of the Institute for Advanced Study and a citizen of the United States.

Seventeen years had passed since Einstein had published his general theory. During this time, he had devoted himself almost entirely to the task of building a theory of “unified field” which would extend beyond his gravitational theory to include all electromagnetic phenomena. In 1929, shortly after his fiftieth birthday, he had published a short paper which indicated that general laws for a unified field could be derived from certain hypothesis regarding the structure of four-dimensional space. However, though Einstein spent the remainder of his life in the pursuit of these laws, he was never able to perfect them to his satisfaction.

His life at Princeton was much the same as it had been in previous years at the Kaiser Wilhelm Institute. Though he acted as advisor for a small group of talented research students, most of his time was devoted to his own work. In 1939, he was approached by two physicists who had fled persecution in Europe. These men, Enrico Fermi and Leo Szilard, described to Einstein experiments in atomic fission being conducted in Germany and urged him to make a direct appeal to President Roosevelt to provide funds for similar research in the United States. Einstein’s subsequent letter to the President touched off the most intensive research program ever conducted in this country — the “Manhattan Project”. The outcome of that program is now history.

In 1954 he retired from his position as professor but continued to take an active part in research at the Institute. His wife, Elsa, had died nine years earlier and his stepdaughter, Margot, had moved to Princeton to live with him. Early in 1949 he became very ill as the result of a gall bladder infection and underwent a serious operation. In the years which followed Einstein’s health was seldom better than fair. Finally the same infection which had earlier sapped his strength returned last month as his executioner.

Albert Einstein’s lifetime has marked a period of unprecedented progress in man’s struggle to interpret the world he lives in. Certainly Einstein alone was not responsible for this revolution in physical theory, but in many cases his work became the foundation of later achievements. This is equally true of other pioneers like Michelson, Planck, and Bohr. Perhaps the philosophy of this era can best be described in Einstein’s own words, “The most incomprehensible thing about the world is that it is comprehensible.”
POWER...
one of 3 great
growth Industries

GO with the company
that's strong in all three!

Hitch your future in engineering to the growth of the U. S. A.—and to a company that supplies the basic needs of growth!

This nation is growing at the rate of 50,000 people every week! To supply the needs of these people:

Electric power generation will double by 1965.

A multi-billion dollar program of new highway construction is planned within the next ten years.

Manufacturing output will have to increase by $3.5 billion by this time next year.

And Allis-Chalmers builds major equipment for all of these growth industries! Some examples are pictured here.

Here's what Allis-Chalmers offers to Young Engineers:
A graduate training course that has been a model for industry since 1904. You have access to many fields of engineering: electric power, hydraulics, atomic energy, ore processing.

There are many kinds of work to try: design engineering, application, research, manufacturing, sales. Over 90 training stations are available, with expert guidance when you want it. Your future is as big as your ability can make it.

Or, if you have decided your field of interest and are well qualified, opportunities exist for direct assignments on our engineering staff.

In any case—learn more about Allis-Chalmers. Ask the A-C manager in your territory, or write direct to Allis-Chalmers, Graduate Training Section, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

May, 1955
A couple of gobs laying over for a day or two in Sweden decided to go to church. Knowing no Swedish, they figured to play safe by picking out a dignified looking old gentleman sitting in front of them and doing whatever he did.

During the service the pastor made a special announcement of some kind, and the man in front of them started to rise, at which the two sailors quickly got to their feet, to be met by roars of laughter from the whole congregation.

When the service was over and they were greeted by the pastor at the door, they discovered he spoke English and naturally asked what the cause of the merriment had been.

“Oh,” said the pastor, “I was announcing a baptism, and asked the father of the child to stand.”

---

**Woman:** “Son, can you direct me to the bank?”

**Small Boy:** “Yassum, for a quarter.”

**Woman:** “Isn’t that mighty high?”

**Boy:** “No, Ma’am, not for a bank director.”

Comment overheard at Military Ball:

She: “What’s the difference between dancing and marching?”

ROTC Student: “I don’t know.”

She: “I didn’t think you did. Let’s sit down.”

---

**D.P.:** “There are 50 bars in this town, but I am proud to say I have lived here all my life and never entered one of them.”

**L.S.:** “Which one is that?”

“I’ll see you,” said Jim as he laid down four aces in a game of strip poker.

“Yes, father,” she admitted, “I weigh one hundred and forty pounds stripped for gym.”

“Who in the thunder is Jim?”

“It’s easy to write a play. First act, boy meets girl. Second act, they hold hands. Third act, they kiss.”

“That’s how I got arrested.”

“What do you mean?”

“I wrote a five-act play.”

---

Scene: Street in London slum. Three urchins 8 to 10 years, playing in gutter. Rolls Royce stops opposite side of street. Alights, a beautiful, expensively dressed blonde. She crossed over to boys, picks up the youngest, hugs him, kisses him, gives him box of candies, parcel of toys, opens silk purse, fills his 2 dirty hands with money, hugs and kisses him again, waves her lily hands, gets into car and departs. Other 2 boys goggle-eyed. Then one says, “Gorblimey, Tommy, woz that yer fairy godmother?” The beneficiary looks at him with scorn: “Naw, that woz my sister wot woz ruined.”

---

“Aren’t you ashamed,” the judge asked the man, “to have your wife support you by doing such menial work?”

“Yes, I am, Your Honor,” he replied, “but what can I do? She’s too ignorant to do anything else.

“Daddy, if you give me a dime I’ll tell you what the iceman said to Mamma.”

“All right. Here’s your dime.”

“He said: “Any ice today, Lady?”

“Don’t tell me your husband is divorcing you for only a slight misunderstanding?”

“Yes, I understood him to say he would be out of town for a week.”

“Have you seen Lucille’s new evening gown?”

“No, what does it look like?”

“Well, in most places it looks quite a lot like Lucille.”

He’d never see eighty again but he desperately wanted to have one last fling and marry the luscious little redhead. After plying her with a several weeks’ buildup of furs and jewels he finally asked her, “My darling, if I enter a sanatorium to have myself rejuvenated, will you become my wife?”

She eyed him thoughtfully for a moment. “No,” she said, “I won’t. But I’ll marry you if you don’t.”
10,000,000 horsepower for America's defense . . .

Two years ago we announced the world's most powerful production aircraft engine.

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Research & Development

(Concluded from page 24)

to the crystal wafer by beta particle bombardment. The report stated, however, that such damage ordinarily decreases as the energy of radiation decreases, and that a threshold energy is now believed to exist below which damage will not occur.

Summarizing progress in the development of atomic and light batteries, the RCA scientists stated that prospects for application lies in areas where low power is required, since the potential power range of devices now being studied is less than that of the common dry cell. However, they added, the basic principles which are being investigated may possibly be extended in the future to the field of large power generation.

GM Develops New High Temperature Alloy

In a technical report D. K. Hanink, F. J. Webbere and A. L. Boegehold of GM Research Laboratories Division detailed development of GMR-235, a nickel base alloy of relatively available metals capable of withstanding high temperatures of gas turbine engines in jet aircraft.

One of its main advantages is sparing use of strategic materials which would be important in a national emergency. In addition to its nickel base, GMR-235 consists of carbon, manganese, silicon, chromium, iron, molybdenum, aluminum, titanium and boron.

Tests have shown the new alloy superior to all other alloys containing much higher percentages of strategic materials, the report said. The GM metallurgists explained that one of the main obstacles in making better jet and turbine engines is the metal temperature limit for turbines blades and buckets. These blades are in the path of burning fuel which not only heats them red hot but also vibrates them by blowing past the blade edges.

They also described how the new alloy is made by compounding several metals in a master heat, casting the alloy in the form of shot for ease of handling and blending heats.

The GM report said precise amounts of boron, aluminum and titanium that go into GMR-235 were determined by making experimental alloys of various compositions and subjecting them to tests.

Casting technique is important to turbine bucket manufacture, and as a side aspect of the development GM metallurgists made transparent plastic molds. High speed motion pictures of water flowing into these molds disclosed turbulence from poor gate design which, in turn, produced casting flaws.

Improvements resulting from these flow studies not only produced better turbine buckets but also made the testing of batches of GMR-235 much more precise and reliable than before.

Woodridge Motor Court

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Photograph above: Engineer-writer John Burnett (left) works with engineers John H. Haughawout (right) and Donald King to compile handbook information.
How good is this spot for a poster?
—photography was put on watch to find out

In the hands of Alfred Politz Research, Inc., camera and film sampled the traffic, spaced test periods, stayed on the job, never got tired and reported with complete accuracy.

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Alfred Politz Research, Inc. worked out an answer. Figuring that anyone the poster can “see” can see the poster, they set up an automatic camera which recorded periods of passing traffic at regular intervals. Counting the people and cars on the film records gave accurate figures on the viewers of the poster and made it possible to compute its gross man-hours of exposure.

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*ILLUSTRATION: Sales Engineer and customers discuss turbine rotor construction. Glasses are factory safety measure.

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