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Rose Technic Staff
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ROSE TECHNIC

NOVEMBER, 1940

MEMBER
ECMA

ROSE POLYTECHNIC INSTITUTE

TERRE HAUTE, INDIANA

A member of the National Defense Advisory Committee recently stated that in his opinion the United States will require the services of more men with engineering training during the next ten years than ever before in its history. The shortage is already acute. Present demand is heavy for engineering graduates in all branches and for all kinds of industry.

There has never been a time when a young man could undertake the study of engineering with better opportunities for essential service to his country than today.

The Registrar will be glad to send you full information on the courses in engineering offered at Rose Polytechnic Institute.

ROSE TECHNIC

VOLUME L NOVEMBER 1940 NUMBER 2

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Photo by Leedy

LABOR ET SCIENTIA

The quiet strength shown in this striking picture of the front of the main building at Rose seems to testify to the fact that the engineers have, and will continue to do, all in their power to provide for future emergencies.

HISTORY REPEATS

It has been accepted as a truism that history repeats itself. Wise ones predict future happenings after a study of past events; and although we do not wish to turn clairvoyant, it is of particular interest at this time to review the activities of Rose during the world chaos of 1917 and 1918.

When war was declared in 1917, Rose, through the Board of Managers, volunteered, without reservations, its services including facilities and material for the prosecution of the war. The curriculum was altered to include special military subjects. Courses were shortened so that the 1917 class might be graduated and enter the service of its country ahead of scheduled commencement. All ordinary holiday and vacation periods of the 1918 class were cancelled so that Rose, by remaining in college session all summer, 1917, graduated the 1918 class on January 5th instead of June 13th, thus releasing for early national service 37 trained engineers. The extra effort and intense application required of both faculty and students was sustained by their patriotism.

The nation was found to be in need of automobile and truck mechanics and drivers. The War Department Committee on Education and Special Training, gladly accepting the offer of service, on May 8, 1917 requested Rose to undertake the training of 100 automobile and truck specialists. The Rose Gymnasium, altered and remodeled, became a barracks. A mess hall was established in the basement of the main building. Recreation rooms, a post exchange, and most important of all, additional shop space, mushroomed into being. The campus was the drill grounds.

On June 15, 1917, Kentucky men began to arrive, were processed through physical examination, established in barracks, and immediately began their technical training. Instruction was conducted along two lines, i.e., technical instruction and military control and training. Automobile repair and maintenance instruction was conducted by a civilian staff of ten men led by Dr. John White, Professor Carl Wishmeyer, and Professor C. C. Knipmeyer. A military staff of 6 officers and men cooperated fully with the civilian staff. It is enlightening to read in the report of that day the following: "The value of such training cannot be over-estimated, as each individual should be a soldier in the fullest and broadest sense first, and expert or artisan second, though the two are of almost equal importance".

To augment the shop facilities at Rose many local concerns loaned equipment and plants for the instruction of these vocational trainees. A fine spirit of cooperation was displayed by the entire community. On August 15 a second 100-man group from Indiana, Michigan, and Ohio began their technical training. People of Terre Haute cooperated through the Chamber of Commerce, and social and church organizations provided amusement and cultural associations for the brief off-duty hours of these men being trained in the care, maintenance, and handling of automobiles and trucks.

In August 1918 Rose was asked to increase the Vocational Training section to 200 men and in addition to organize, by October 1, 1918, a Student Army Training Corps (Forerunner of the Reserve Officers' Training Corps) of 250 men. This group was to be prepared for future instruction in the Officers' Training Camps. Buildings near the campus were rapidly turned into barracks, offices, hospitals, and other facilities necessary to house and care for the 450 men whom Rose willingly undertook to train for war services.

This transition from a peacetime engineering college to an expanded military academy on a war footing in a short period of time attests the adaptability of Americans to rapidly changing situations and their inherent ability along administrative and organizational lines. It is believed, however, that no such drastic changes are contemplated in our present emergency. Other than the Reserve Officers' Training Corps there will be, apparently, no military activity on the college campus. However, it is believed technical or vocation training courses are to be conducted at colleges.

Records are too incomplete and meager to show all the World War activities of the 850 Rose graduates in the 1918 emergency. It is definitely known that at least 245 saw military service in the Army, Navy, or Marine Corps. Twenty were engaged in important research work for the United States Government. Ninety were engaged in special industrial work for the United States Government. Many undergraduates served with the armed forces, and 400 men were given vocational training. The cessation of armed hostilities in the fall of 1918 halted, of course, war training at Rose.

The Reserve Officers' Training Corps at Rose was begun on February 15, 1919, and since that time has trained and qualified about 1500 students for non-commissioned service and has commissioned in the reserve 252 officers; almost enough leaders for an army division had all kept up the military training so well begun in college days.

In the Rose files, yellowing with the passage of years, there is a certificate bearing the War Department Seal and signed by the Adjutant General of the Army and the Assistant Secretary of War, which reads:

"This is to certify that Rose Polytechnic Institute, in a spirit of patriotism and of devotion to country, rendered efficient and loyal service in connection with the World War——".

And history repeats . . .

by Captain Frederic A. Henney, C.E.
Professor of Military Science and Tactics

BEHIND THE 50,000

by Leon L. O'Dell, ch.e., '42

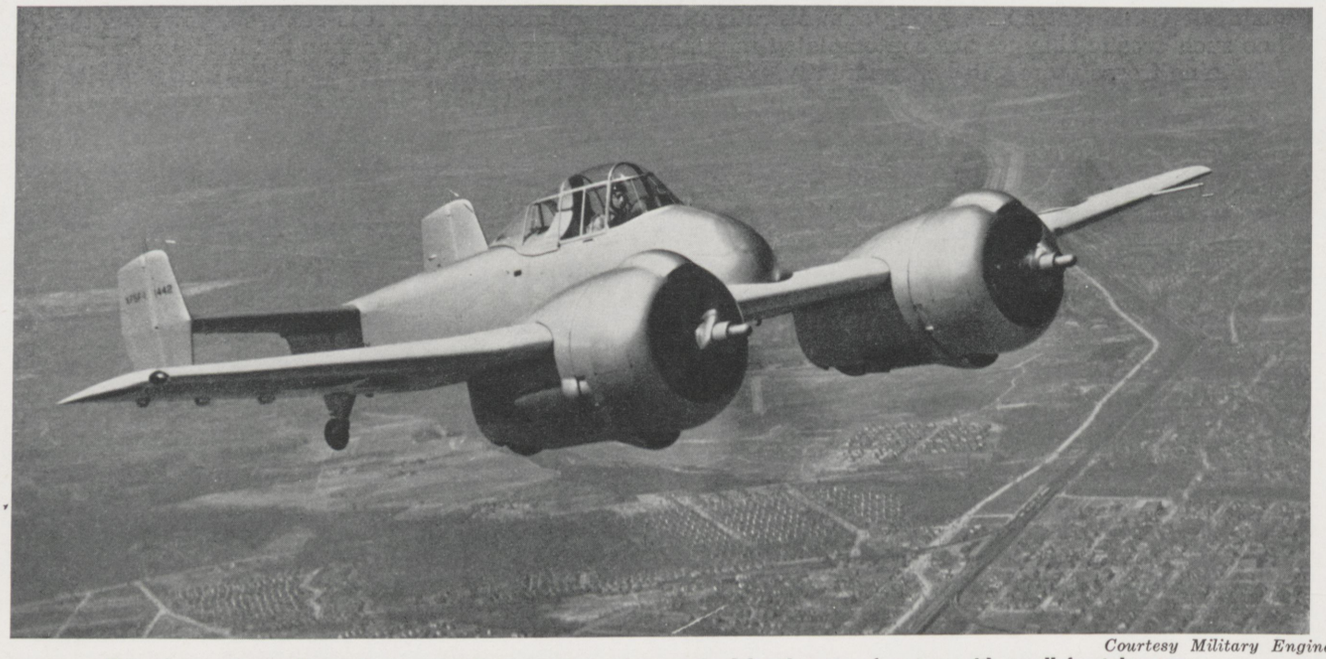
Behind the 50,000 planes which our President has requested for the United States Air Force there lies a history of development unsurpassed in rapidity of improvement. Since the first huge sums of money were spent in research and development of the aircraft industry during the first World War, the industry has grown steadily. With the advent of the present war policies, the production of aircraft has assumed a new significance, and is fast becoming one of the nation's major industries.

Mr. O'Dell traces the development of the aircraft industry from the days of 1914 up to the present time and presents the latest improvements in plane design in a timely article.

DURING the past months in the European War the air corps of the various nations have played a significant role. These air corps are composed of planes varying in size from small pursuit planes carrying eight machine guns and a small-bore cannon at speeds approaching 400 miles per hour to enormous four-motored bombers capable of flying 2500 miles with three tons of bombs and returning to their base. These planes are so different from those used at the beginning of the first World War that it is difficult to imagine the early Bleriot-Taube as a forerunner of the modern Spitfire or Messerschmitt.

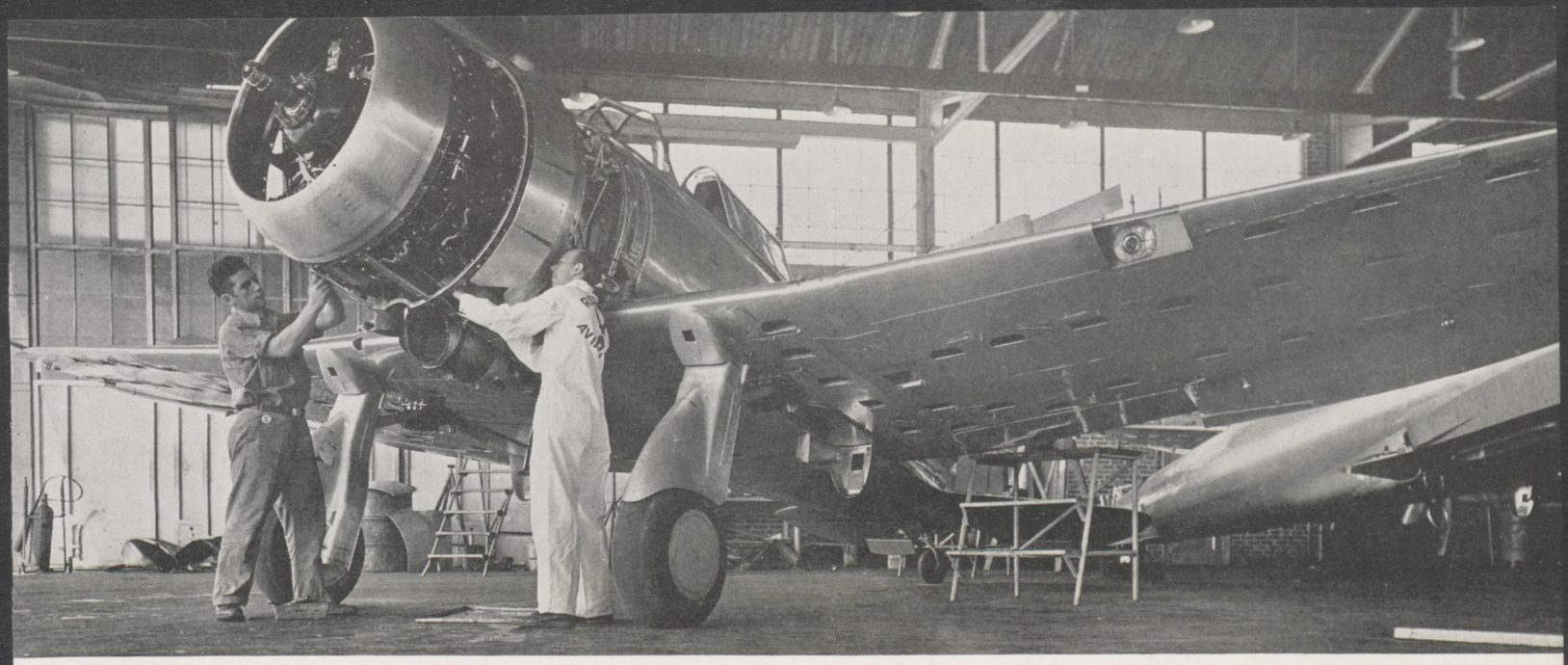
When Great Britain declared war in 1914, the Royal Air Force was composed of thirty-seven unarmed airplanes that were used only on reconnaissance flights. They were, in general, powered by motors developing about 80 horsepower and would attain speeds of nearly 70 miles per hour. Most of the pilots on both sides were acquainted with each other before hostilities began and would wave as they passed in the air. Just how or when fighting in the air started is not known exactly, but the throwing of a brick or wrench into the propeller of a plane belonging to the opposite side is generally accredited with causing the end of the friendly greetings exchanged by pilots. This action naturally called for retaliation, and a race developed to see who could carry the most effective weapons. The first attempt to mount rapid-fire weapons on an airplane is accredited to a Frenchman who fastened steel plates on his propeller blades to deflect any bullets which failed to pass between the blades. The next development was made by Tony Fokker, the famous Dutch inventor, who perfected a device to permit the firing of a machine gun through the propeller; this device gave the Germans a decided advantage in the air for some time. The French and British answer to the Fokker equipped with this gear was the producing of a pusher plane carrying a machine gun firing forward and giving the pilot a wide range of vision. The use of pushers by the allies continued until late 1915 when the Constantinesco gear was invented. It was successful, using oil pressure to operate the gun. A cam fastened to the propeller shaft caused a pulsation in the pressure of the oil and fired the gun. Before the production of the gear became large enough to equip every plane with it, the allies utilized tractor-type planes by mounting the machine gun on the top wing in a manner which allowed the gun to fire above the arc of the propeller.

Better features of design and more powerful engines in 1916 increased the speeds of the planes to 100 miles



Courtesy Military Engineer

This picture shows the modern streamlining that can be acquired by the use of motors with small frontal areas.



Courtesy Aviation

The hinge-type retractable landing gear is clearly visible in the above photograph.

per hour. One of the features was the use of steel tube construction in assembling the planes of that year. Steel tube not only strengthened the planes but also speeded up production.

Toward the end of the war the allies began to show a marked superiority over the Germans in the air and in the design and workmanship of their planes. The poor quality of the gasoline used by the Germans at this time cut down performance to a marked degree. Pursuit squadrons were being supplied with craft powered by 400 horsepower engines and capable of attaining 150 miles per hour. The bombers in production when the Armistice was signed could easily have bombed Berlin had they reached the front in time.

During the course of the war huge sums of money were expended in research and on the development of the aircraft industry. In the United States alone one and a half billion dollars were spent, although only a very few American-built planes were ever used at the front.

The liquid-cooled motor used during the World War, and nearly forgotten in the designs of 1930-1937, has again come into use in high speed fighters. It was a United States Army plane powered by a motor of this type that held the world's speed record of 266.59 miles per hour in 1923. The coolant generally used in liquid-cooled engines is prestone, which has high cooling qualities and permits the use of a smaller volume with a subsequent saving in weight.

Gasoline is usually fed into the cylinders by a downdraft carburetor equipped with a supercharger; however a new engine of German design has an injection fuel system which is composed of one injector for each cylinder that shoots the correct amount of raw fuel into the cylinder where it is mixed with the proper proportion of air from the supercharger. This system has the advantages of providing a positive fuel supply during dives and other aerial acrobatics and of being less sensitive to the quality of fuel used.

The air-cooled engine may be either of two types, rotary or radial. In the rotary motor the crankshaft is fixed and the main body of the motor revolves around it, while in the radial the cylinder heads are fixed with the crankshaft revolving in the ordinary manner. The objection to the rotary is that the great torque produced makes planes powered by it extremely hard to maneuver.

Even though foreign engineers continued to use the liquid-cooled motor that provided a more streamlined installation, the American designers switched to the use of the air-cooled radial motor that promised a lower weight per horsepower ratio. They succeeded in producing the finest motors in the world, but until recent months when they lengthened the crankshaft, they had not discovered any way to prevent the planes using them from having a blunt nose which increased air resistance.

The usual radial motor is composed of a single row of cylinders, but in 1929 the double bank radial made its appearance. The original model had two rows of six cylinders, each arranged one behind the other on a two-throw crankshaft with overhead gear-driven cam shafts. Block tests proved that it was the most powerful air-cooled engine produced up to that time, as it developed 600 horsepower. Because of its unusual construction it had smaller overall dimensions than ordinary engines of this type that were rated at 400 horsepower.

This type of engine with fourteen cylinders is used today in most of the higher-powered, air-cooled engines because larger displacement and therefore more power is possible with no increase—actually a substantial decrease—in frontal area. This lends itself readily to better streamlining, whether the plane be of multi-engine or single-engine design. Greater crankspeeds are obtained through the use of smaller cylinders; this contributes to smooth operation, while the smaller, more

frequent power impulses further contribute to smoothness and long life.

Increased speeds demanded better lubrication, and one of the improvements brought out was automatic valve lubrication. The system caused a change in the usual engine design in order that pressure oil might be carried through the pushrods, rockers, and rocker bearings to the valves and valve guides, thus eliminating the periodic manual lubrication of these important parts.

Another improvement was the automatic oil temperature valve which by means of a thermostat in the mechanism returns all oil below 155 degrees Fahrenheit directly to the oil supply tank adjacent to the outlet and passes all oil above 170 degrees through the oil cooler. The lubricant is by this means brought to operating temperature almost immediately and automatically maintained there through all weather conditions.

These engines also caused a change in cylinder head manufacture. It was found necessary to provide proper cooling and still have sufficient strength to withstand the high pressure and wear to which the cylinders are subjected. Through the improvement of foundry technique the cooling fin area was greatly increased by casting cooling fins on the cylinder as closely spaced as the teeth on a comb and nearly two inches in depth over the combustion chamber. The barrels of the cylinders are of Nitralloy steel, nitrided to obtain a cylinder bore with a surface having three times the wear-resisting qualities of ordinary heat-treated steel cylinder barrels. A feature to assist in the cooling of the engine is the use of sodium-cooled valves in which metallic sodium is used to fill the hollow shaft of the valve.

Although it has never been used to any great extent in airplanes up to the present time, a great amount of research work has been done on the Diesel engine. The Germans have done the greater portion of this research and now claim to use Diesel engines in some of their first-line planes.

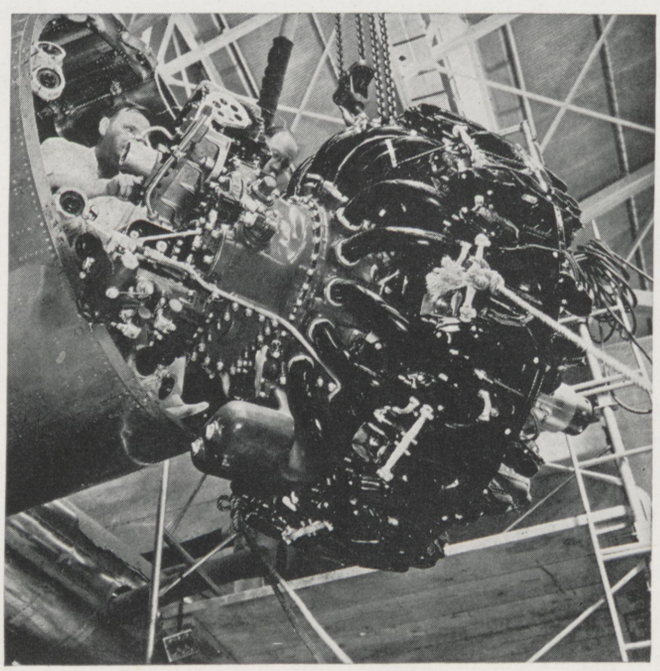
The Diesel engine was first produced by the eminent German engineer, Dr. Rudolph Diesel, in 1892, but the growth of the engine in the aircraft field was slowed until after the development of high strength alloys. Previous to the development of these alloys the engines had to be of heavy construction in order to withstand the pressure developed in a fuel oil engine, thus increasing the weight per horsepower too greatly. A factor which has hindered its growth in the United States is the availability of high-test aviation gasoline.

All present-day fighting planes are equipped with metal propellers; the constant-speed type is nearly standard equipment on planes manufactured in the United States. The constant-speed propeller is a development of the two-position variable pitch propeller in which the blades could be set at either high or low pitch. The constant-speed propeller provides an infinite number of pitch settings and automatically selects them as needed without the attention of the pilot. Through the use of constant speed propeller the engine develops maximum power at any time without overspeeding and is automatically maintained at a constant number of revolutions per minute regardless of the altitude or forward speed of the plane. Full power can be developed throughout the take-off and can be regulated by the pilot at any time by throttle adjustments.

The constant-speed propeller is, in effect, the combination of the controllable propeller with an automatic unit known as the constant-speed control.

The pilot may select whatever number of revolutions per minute he desires, and the constant speed control, acting as a governor, will maintain the engine at that speed. If the engine tends to speed up or slow down, it is immediately counteracted by a change in the pitch of the propeller.

The control unit of the constant-speed propeller is a self-contained governor and is mounted on one of the engine's accessory pads or on a special pad built into the nose of the engine. A small gear pump driven by the engine is incorporated in the control unit. This pump takes oil from the lubrication system and raises its pressure to approximately 200 pounds per square inch. A built-in relief valve regulates the pressure and returns all oil to the gear pump except that which is actually required to change the setting of the propeller. Only a very small quantity of oil is actually drawn from the engine, inasmuch as oil is demanded by the propeller only when lowering the pitch.



Courtesy Aviation

The installation of a large radial motor offers many engineering problems.

Among the important features of design not mentioned previously are retractable landing gears and wing flaps. The latter, as the name implies, are flaps

(*Continued on Page* 25)

REGISTRATION OF PROFESSIONAL ENGINEERS

by William M. Hales Jr., e.e., '41

Although this article has no connection with peace-time conscription, it is of increasing importance to the engineering profession. The licensing of doctors to restrict the operations of "quacks", and the limitations placed on the practice of law were both caused by an urgent need to better public welfare. Likewise, the registration of engineers raises the engineering standards of the country to the betterment of public welfare and improves both social and economic conditions within the profession.

Mr. Hales discusses the growth of engineering registration, immediate plans for expansion, and the benefits which result from such organization.

JUST what is meant by "Registration of Professional Engineers?" Does it mean, (a) registration for the draft in case of war, as it might be taken by the common public at the present time, or does it mean, (b) something far greater and important to the practicing engineer and the engineer student? We who are engineers or students of the engineering profession should be very much interested in the present growth, full understanding, and benefits received from the following quotation taken from the Indiana Registration Law: "Section 1. Be it enacted by the general assembly of the State of Indiana, That, for the purpose of safeguarding life, health, and property no person shall practice or suffer to practice the profession of engineering or of land surveying in this state, unless and until such person shall submit evidence that he is qualified so to practice and shall have been registered, as hereinafter provided. It shall be unlawful for any person to practice or offer to practice the profession of engineering or land surveying in this state or to use, in connection with his name, or otherwise assume, or advertise, any title or description tending to convey the impression that he is a professional engineer or a land surveyor, unless such person shall have been duly registered or is exempted under the provisions of this act."

In 1907 Wyoming adopted the first state law regulating the practice of professional engineering and was followed closely by Louisiana in 1908, then by Illinois in 1915, and by Florida in 1917. However, it was not until the period from 1919-1922, when 17 states joined the registration group, that the registration of engineers became a nation-wide movement. During the past five years fourteen more states followed, making 42 states at present who have registration laws. It is to be noted that in none of the 42 states having registration laws has there been any move to abolish this law. On the contrary all moves are designed to make it better and stronger.

There now remain only six states —Delaware, Massachusetts, Missouri, Montana, New Hampshire, and North Dakota—which do not have laws requiring the registration of engineers, and three of these have active committees that are preparing such legislation. Hawaii, Puerto Rico, and the Philippines have engineering registration laws. The District of Columbia has a registration bill pending in Congress, and Alaska has appointed a committee to investigate the desirability of a registration law. Several states are now considering amendments to existing laws in order to include additional classifications or to improve the provisions for administration and general procedure. The trend of engineering registration in recent years seems to indicate that in a few more years every state in the Union will require legal registration of all professional engineers who are in responsible charge of engineering work wherein the public welfare and the safeguarding of life or property are concerned.

Of course we, as engineers, cannot alter the nature of our profession. We can and have, however, provided ourselves with an organization that will bring us together on a common front in the fight for improved social and economic conditions within our profession.

The registration law provides for the appointment by the Governor of a Registration Board of from three to nine members. Such an appointment might be assumed to be political, but so are the boards for our large state schools, usually. Actually the Governor is usually furnished a list of engineers recommended by the representative society of engineers of the state, and from this list appointments are made. In many boards the members do not know, and do not care to know, the political learnings of their colleagues. The members generally are of a high type, with a strong sense of responsibility, and great faith in the good that registration can do.

The registration boards had many problems in common, which in the interests of justice and efficiency, could best be settled together. Be-

Professor Knipmeyer Aiding Registration

Clarence C. Knipmeyer, professor of electrical engineering at Rose, attended the annual convention of the National Council of State Boards of Engineering Examiners. The convention was held in Charleston, S. C., the week of October 27.

Professor Knipmeyer also addressed the Missouri Society of Professional Engineers and Architects, October 4, concerning Missouri's plan to enact a law providing for the licensing of professional engineers.

cause of this the National Council of State Boards of Engineering Examiners was formed. It is the coordinating and advisory body for all the state boards.

The National Council was organized on November 8, 1920, and celebrated its twentieth anniversary at the annual convention held in Charleston, South Carolina, October 28-31, 1940. The membership of the National Council now consists of 43 member boards, which are legally constituted boards of registration for professional engineers. These member boards represent a total of over 66,000 registered professional engineers and land surveyors.

It was early recognized that the various state registration laws should be as nearly uniform as possible so as to allow easy reciprocal relations between states and also to approach as close to the ideal as practicable. With this in mind, all the major engineering societies and groups have had official representatives sit in at the council table to draft a Model Law. The first Model Law was drafted in 1911. A new draft was made in 1915 by a joint committee of six national engineering societies. Other drafts or revisions were made in 1920, 1925, 1929, 1930, 1931, and 1937, with all or nearly all groups of engineers represented in the conferences. The method of striving toward an ideal was as efficient, as democratic, as representative, and as conscientious as was humanly posible.

This Model Law, the product of many years of the best thought, of many delberations, and muct experience, is, with slight modifications, the law under which the State of Indiana proceeds with its legal registration.

In deliberating over this proposed law, we have three points of view: the public good, the advancement of our profession, and our personal welfare. The preamble of this law states: "In order to safeguard life, health, and property, and in the interests of public welfare . . ." Here is stated the real intent of the law. The public is entitled to this sort of protection, and law is needed to insure it. An incompetent engineer, shrewd and smooth of speech and manner, can easily take advantage of the public. Only a registration law can protect the public from such a man. Happily it is true that nearly all engineers are trained in honesty through constant, respectful—even reverential—association with the great truths and inexorable laws of science, but, unhappily, not all are properly inspired. These latter can not only jeopardize life, health, and property, but they can lower the ideals and standards of the profession. Only good engineers themselves can promptly evaluate the competency and ethical standards of such men. Hence the need of a board of engineers. Finally, although the law is not proposed for the well-being and advantage of the individual engineer, its blessings extend beyond its intended sphere into the lives of the engineers themselves. To this surely no one will raise a protesting voice. Engineers belong to a *profession—not to a trade*. Their professional conscientiousness is above selfishness of trade unionization, yet a serious threat in that direction must be recognized. Some, indeed, are now joining trade unions. C.I.O. is claiming many. This threat can only be removed by a genuine yet efficient registration law.

It is interesting at this point to consider two other large professional groups having registration or licensing laws, the lawyers and physicians. For both groups licensing laws were acutely needed for the public welfare. Their laws were passed and the administration of them was placed in their own hands. The laws have proven of enormous value to the public and, incidentally, to the members of these professions.

The public trusted each of these two professional groups to administer its own licensing law with proper regard to public interest. Shortsightedness and failure to completely keep its trust has already cost the legal profession parts of its field of activity. Judicial procedures have been replaced by arbitration boards in many activities. Administration boards in many lines are crowding lawyers out. It is to be noted, too, that failure of the medical profession to see fully its responsibilities, particularly to the poor, is resulting in a serious threat of socialized medicine as a department of the national government. Physicians can combat this threat only by actively recognizing their public responsibility. It is a well established fact that no group can remain selfish and continue to retain power and influence long.

The prestige of the medical profession and the well-being of physicians generally were greatly enhanced by licensing and by group action looking to more favorable practical relations with the public. The engineering profession and its membership have been suffering from the lack of these things. We very properly are proud of our idealism and of the fine ethics we set before us, but they must be helped to function through practical instrumentalities. Engineers have been too individualistic to achieve proper recognition from the public for their group. Too generally we have been looked upon as hired men, valuable ones to be sure, but hired men. As such many will suffer from regimentation in the large industrial organizations, and many others will drift into labor unions where more favorable hours and pay might be expected. Our lack of professional organization is steadily encouraging labor union activities within our own group. We must take recognition of this fact. Great social changes are taking place. In the interests of public welfare, of our profesion, and of ourselves, we must guard against such changes as will lower standards of competency, of ethics, and of character and bring the profession of engineering to lower levels. While guarding against the dangers of regimentation and unionization, we must realize, too, that in this age of high pressure fighting for advantage, ideals in engineering are likely to suffer. Evidence comes steadily to the registration boards of fraud, incompetency, and violation of ethics. For this reason the character qualifications of an applicant weigh quite as heavily as technical qualifications,

and the law states that any person may prefer charges of fraud, deceit, gross negligence, incompetency, or unprofessional conduct against any registrant.

But the situation for the engineering profesion is not dark. The national societies, representing the various branches of engineering, set high standards for technical knowledge and ethics; the state sections encourage group spirit and active public relations; and the state groups are brought together by coordinating state engineering societies. Professional relations with the public are particularly a responsibility appropriately assumed by the National Society of Professional Engineers and its member groups in many states.

Up to this point there is and can be only moral suasion. Add now the force of law in the engineers' hands through registration. Men from their own groups administer the registration laws, and they stand ready to enforce that law just as thoroughly as engineers want it enforced. Nothing now is lacking in the way of instrumentalities to safeguard public welfare and professional well-being, if the engineers themselves as a unit will support their law and make it function. The public, through its representatives, gives the engineer their law and trusts them to enforce it. The law can function as a blessing to the public and a godsend to the engineers. The responsibility rests entirely upon the engineers. Will they be regimented, unionized, exploited, and have unworthy men in their ranks; or will they be an outstanding, fine group of professional men, closely united under high ideals and serving the public with honor and distinction?

MODERN ENGINEERS

by John E. Bartmess, m.e., '41

Charles Henry Purcell

The TECHNIC again presents "Modern Engineers." This, the second article of the series, is the biography of Charles Henry Purcell, California State Highway Engineer and Chief Engineer in the building of the famed San Francisco-Oakland Bay bridge.

The contributing editor extends thanks to John A. Roebling's Sons company and to the California Department of Public Works highways division for the information used in this article.

Charles Henry Purcell was born at North Bend, Nebraska, January 27, 1883, a son of John and Mary (Gillis) Purcell. His paternal grandfather came to the United States from Ireland during the Civil War and settled at Freehold, near Albany, New York.

John Purcell, father of Charles Henry, was born in New York but later, with his three brothers, settled in Nebraska. John, with his brother Thomas, entered the grain and banking business. William H. Purcell moved to Chicago, where he became one of the pioneer grain merchants and maltsters, and where he was one of the first members of the Chicago Board of Trade. The fourth brother, Charles A. Purcell, went into partnership with William H. and was later the first president of the American Malting Company. William Gray Purcell, retired architect, is the son of Charles A. Purcell. The only sister, Mary Dawling, died in Los Angeles, California, in 1933. The mother of Charles Henry Purcell, Mary (Gillis) Purcell, was a daughter of John Gillis superintendent of a coal mine in Cape Breton, Nova Scotia.

Mr. Purcell received his early education in the public schools of North Bend, Nebraska, where he completed high school. He entered Stanford University in 1903 but transferred back to the University of Nebraska from which he was graduated in 1906 with the degree of Bachelor of Science in Civil Engineering. He had already started his engineering experience during his sophomore and junior years in the Nebraska University by working Saturdays and vacations as an engineering draftsman for the Burlington Railroad.

After graduation the pull of the life he knew at Stanford gradually pulled him westward. His first position was that of resident engineer of the Union Pacific railroad at Rock Springs, Wyoming. His various occupations thereafter were as structural design engineer at Ely, Nevada, for the American Smelting and Refining Company, 1907 and 1908; assistant chief engineer of the Cerro de Pasco Company, large South American copper producers of New York and Peru, 1909 and 1910; designer of structural parts for gold dredgers for the Yuba Construction company, Marysville, California, 1911; chief engineer of the Washington Northern railroad, Cape Horn, Washington, 1911; bridge engineer of the Oregon State Highway department, 1912; bridge engineer for Multnomah county, Oregon, engaged especially to design and construct the Columbia River Highway bridges, 1913. In 1914 Mr. Purcell married Minnie Pullen, daughter of Andres Pullen of Portland, Oregon.

He later returned to the Oregon State Highway department where he remained until 1917 as bridge engineer. In this year Mr. Purcell was appointed bridge engineer for the United States Bureau of Roads and in 1919 was named district engineer for the Bureau at Portland, Oregon. In February, 1928 he was appointed state highway engineer for the state of California.

Because of his record and brilliant qualifications Mr. Purcell was ap-

pointed secretary of the Hoover-Young commission in 1929. The purpose of the commission was to make a survey and prepare preliminary plans and designs for the proposed San Francisco-Oakland Bay bridge. The commission adopted the bridge plan prepared under Mr. Purcell's direction. In January, 1931, because of engineering qualifications and exceptional organizing ability, he was appointed chief engineer for the San Francisco-Oakland Bay bridge project in addition to his post as state highway engineer. This bridge is the largest single job ever to come the way of Mr. Purcell and is the "biggest bridge-building job in history."

Robert K. Morse, in his article *Bridges, Abridged,* which appeared in the February, 1940, issue of the *Rose Technic,* stated:

"The main structures of the San Francisco-Oakland Bay bridge total over five miles, not counting the elevated approaches and double-decked tunnel through Goat Island. The tunnel has the largest bore of any ever built, being able to clear a five-story building. The bridge is placed on the deepest and largest underwater foundations ever built. They extend as much as 242 feet below water level. This is the first time that two suspension bridges have been built end to end, also the caisson of the mid-channel anchorage block broke all size records. The final dimensions of this great concrete shell are 504 by 197 by 92 feet. Over the West Bay are two suspension spans exceeded by only the Golden Gate and the George Washington bridges, and the East Bay cantilever is surpassed only by the Quebec and Forth Bridges. The project took the greatest tonnage of steel ever used in a single job and cost the most—$77,200,000."

Mr. Purcell is an associate member of the American Society of Civil Engineers and a recognized national authority on public highways.

He is also a member of the National Executive committee of the American Association of State Highway Officials and is a representative of the United States on the Permanent International commission of the Permanent International Association of Road Congresses. Mr. Purcell was appointed a member of a committee of twelve nationally known highway engineering experts by ex-secretary of Agriculture Henry Wallace in June, 1937, to promote maximum safety and highway utility; official title—Special Committee for the Consideration of Administrative and Design Policies for Highways. He served as president of the American Association of State Highway Officials in 1938. In November 1937 Mr. Purcell was appointed Executive Officer, California commission for the 1939 Golden Gate International Exposition.

He holds honorary degrees of Doctor of Laws from the University of California and Doctor of Engineering, University of Nebraska. His clubs are the Rotary, Family, Olympic, and Press club of San Francisco; Portland Lodge of Free and Accepted Masons; Athenian Nile club, Oakland; Sutter club and Del Paso Country club, Sacramento. He is a member of the Chi Phi fraternity.

Courtesy American Institute of Steel Construction

San Francisco-Oakland Bay Bridge, a monument to the work of an engineer of today.

THE ROSE TECHNIC

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Faculty Advisers

JOHN L. BLOXSOME — HENRY C. GRAY

Industry and National Defense

Today as our nation prepares for national defense each of us has a part to take. The engineer has a valuable part in the function of this program. His technical training is necessary for the correlation of the needs of the army with the production of industry. For every man at the front several men are needed in the factories to provide the munitions. For mass production the war materials must be standardized. Only by constant research and development and finally pilot plant operation can satisfactory, standardized equipment be produced.

Constant testing must be carried on to preserve the quality of the materials. Materials must be found which can be substituted for those that might become unavailable. All of this requires the services of more engineers. Men with technical training must, therefore, be available to control the enormous industrial operations required to support a modern war.

The army carries on a great deal of research and development through its various departments, such as the Chemical Warfare Service, the Ordnance Department, the Signal Corps, and the Quartermaster Corps. Of course, they require the cooperation of industrial concerns in the design and manufacture of the equipment. Specifications are made which the contract holder must embody in the item produced. In some cases the specifications cover the operation or performance of the article only. The manufacturer is then left to choose the design and materials most convenient to him. In most cases, however, the manufacturer must produce a product different from his usual form. A certain amount of adjustment must be made for production. Here is the major job of the engineering profession.

Of extreme importance to the war materials manufacturer is the problem of obtaining and maintaining adequate personnel. If possible, men other than those subject to the draft should be trained for those jobs which require a special technical knowledge. A large number of the members of the engineering profession would be called away from their industrial positions as Reserve Officers or government consultants in the case of mobilization. These men have been trained for specific assignments so that the government will be assured of adequate technical assistance. Their places would have to be filled immediately. Men now concluding their schooling will probably have the job of filling many of these vacancies.

Great expansion of our existing plants and facilities must accompany the tremendous burden that will fall on industry. There must be cooperation between the manufacturers, government, and industrial research concerns to expedite the procurement of needed materials. It is the patriotic duty of the manufacturer to maintain the quality of the article, keep it within the specifications, and deliver it with as great a speed as possible. Military operations are based upon the availability of adequate quantities of standard materials. Specifications are made so that they can be met when operating under war-time conditions. No lowering of the standard or compromise of the quality is permissible in the performance of military products.

—*H. L. M.*

Matriculation

Registration day found 281 students enrolled at Rose for the coming year, distributed throughout the four departments as follows:

	Ch.E.	C.E.	E.E.	M.E.	Total
Seniors	12	5	10	15	42
Juniors	16	8	14	18	66
Sophomores	21	8	23	34	86
Freshmen					97

The trend at present seems to be toward mechanical engineering, with 36% of the upperclassmen taking the mechanical course; 27%, the chemical course; 26%, the electrical course; and 11% enrolled in the civil department.

This year's freshman class consists of the largest number of non-resident students ever enrolled at Rose. With Deming Hall filled to capacity several out-of-town freshmen have been forced to seek rooms in the city.

RESEARCH AND DEVELOPMENT

edited by Alan W. Ker, m.e., '43

Cloth Abrader

The Taber abrader was originally designed for industrial use in testing the resistance of plated metals to abrasion. Recently it has been adapted to testing the wearing qualities of cloth. The pressures used are considerably smaller than those required in the larger abraders for metals.

The fabric to be tested is clamped in a special ring that is rotated between two abrasive wheels. A motor turns the head at between sixty and seventy revolutions per minute. To compare the wearing qualities of two fabrics, they may be subjected to the abrasion for the same length of time and then a comparision made by inspection. The specific wearing quality of the cloth must be obtained by tests under strict control.

Courtesy Scientific American

The upper picture shows samples of cloth used in the abrader; the lower shows the abrader itself.

Centrifugal Quenching Machine

The Hannifin Manufacturing Co. of Chicago has developed a quenching machine that employs centrifugal force to apply the coolant. This method reduces distortion of circular parts to a minimum. The machine is designed to supply a large volume of the quenching medium at a uniform, controlled temperature. The centrifugal force causes the fluid to take the form of a ring or doughnut, the hole size being governed by the amount of fluid present.

A heated part to be quenched such as a gear, sprocket, or bearing race is inserted into the lower fixture of the machine. A mandrel may be used to center the piece until the automatic holding fixture grips it. The holding fixture when closing effects a mechanical straightening of the hot part and also prevents warping during the quenching when it is closed. The upper holding fixture is enclosed by a circular quenching chamber which is the container for the liquid when in the closed position.

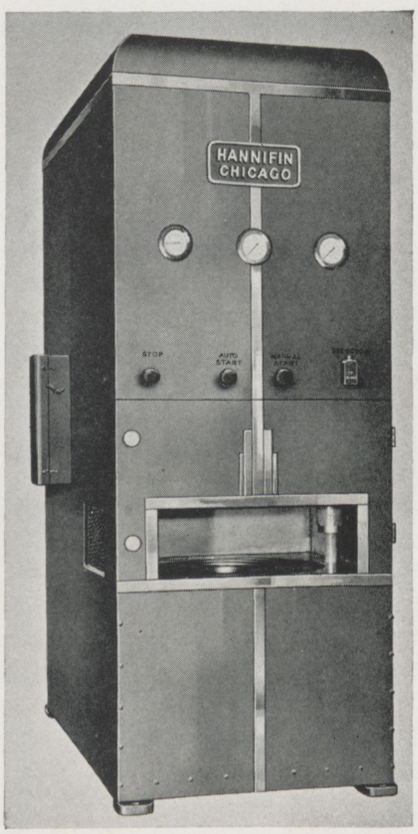
After closing the fixtures, circular quenching chamber and the heated part are all revolved; the quenching fluid is then admitted at the sides of the chamber and allowed to drain at the bottom. The quenching medium is forced in at an accurately controlled temperature and volume and is replaced and drained so that constant volume and temperature are maintained.

Centrifugal quenching not only avoids distortion of circular parts but also allows control of the rate and degree of quenching. The whole process is automatically controlled with uniform timing which can be adjusted for various parts. In this machine sectional quenching may be obtained very easily. For example: in quenching a gear the teeth may be hardened without affecting the hub simply by keeping the volume of fluid in the quenching chamber small enough to form a large hole.

The Hannifin Quenching Machine is very easily adapted to production work. In the case of a sprocket or gear the complete cycle requires only forty to sixty seconds and produces a high quality product. Some of the advantages of this type quenching are correction of mechanical alignment while hot, accurate control of the temperature and volume of the quenching medium, and control of the quenching time.

Color Television

On September 4th the Columbia Broadcasting System demonstrated television in natural colors. The slight loss of details was more than compensated for by the presence of



Courtesy Machinery

A view of the centrifugal quenching machine which assures uniform parts by accurate control of the quenching process.

color and could have been eliminated by the use of a more sensitive pick-up on the camera. The reproductions had all of the color values of the Kodachrome film from which they were transmitted.

The color television system employs a standard camera tube, a standard television channel, and a standard white screen picture tube of high brilliance. The color is introduced through rotating filter discs containing red, green, and blue segments. One disc is placed in the transmitter between the camera and camera tube. Another disc is in the receiver between the screen and the eye. These discs are rotated synchronously at such a speed that parts of two colored filters are present for each scanning of the field; then for the next scanning the last of the second color and part of the third are present. The speed of the discs is 1200 revolutions per minute for 120 scannings per second. The colored filters allow only their color of light to pass through and enter the camera tube. This light is transmitted through the standard television channel just as is white light. The white screen picture tube projects a white image upon the screen; however, between the screen and the eye is one of the rotating discs which changes the while light to the proper color. The separate color impressions are transmitted so rapidly (actually 120 per second) that they blend in the mind of the observer and produce an accurate tri-chromatic picture.

Since it requires three scannings to complete a picture, it might appear that pictures must be sent three times as fast as the rate of 60 frames per second for black and white pictures, but in practice the ratio used is only two to one. The shape of the filter segments permits two colors to be sent on one scanning and so reduces the all-over flicker to a minimum.

One of the several difficulties encountered in the development of color television was the fact that the transmission efficiency of the filter discs was in the order of 30 per cent. Three times as much light was required for the camera tube; therefore a high-brilliance picture tube had to be developed for the receiver. In the demonstration ordinary alternating current was used to synchronize the discs. In commercial practice, however, a phonic motor controlled by television signal sync pulses would be used in tandem with the main drive motor. One of the mechanical design problems that still must be solved is the reducing of the noise of the gear reduction drive and the noise of the motion of the disc in air. In the future there is no reason why these difficulties cannot be overcome so that color television will be practical.

Resonant Tachometer

The J. G. Biddle Company has recently developed a vibrating reed tachometer for checking the speed of electric refrigerators, vacuum cleaners, electric shavers, concrete vibrators, and other equipment where it is impossible to use an ordinary tachometer. The "Fram Hand Tachometer" is merely held against a part of the machine to be checked so that the vibrations are transmitted to the instrument.

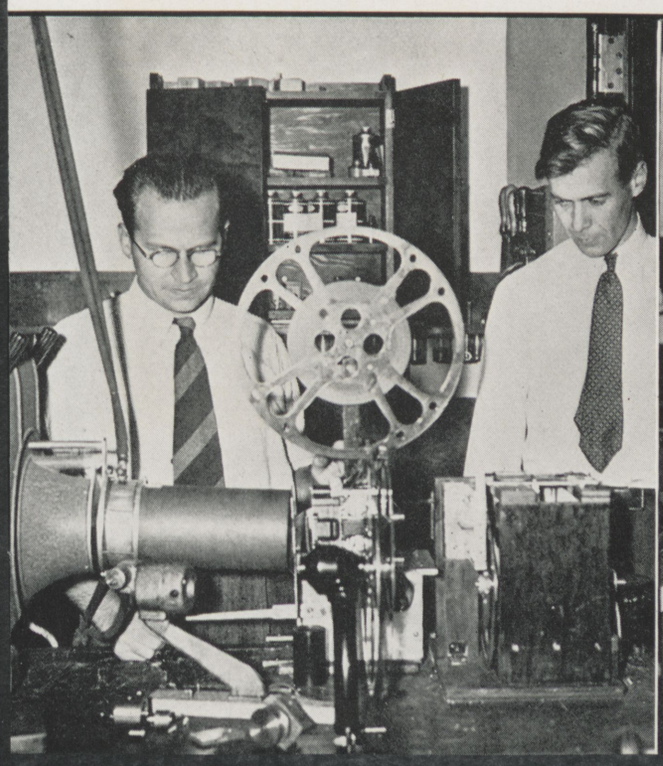
The device is built on the tuning fork principle. It has a set of very accurately tuned steel reeds which vibrate when in resonance with the vibration of the machine. The speed of the machine is shown on a dial on the face of the instrument.

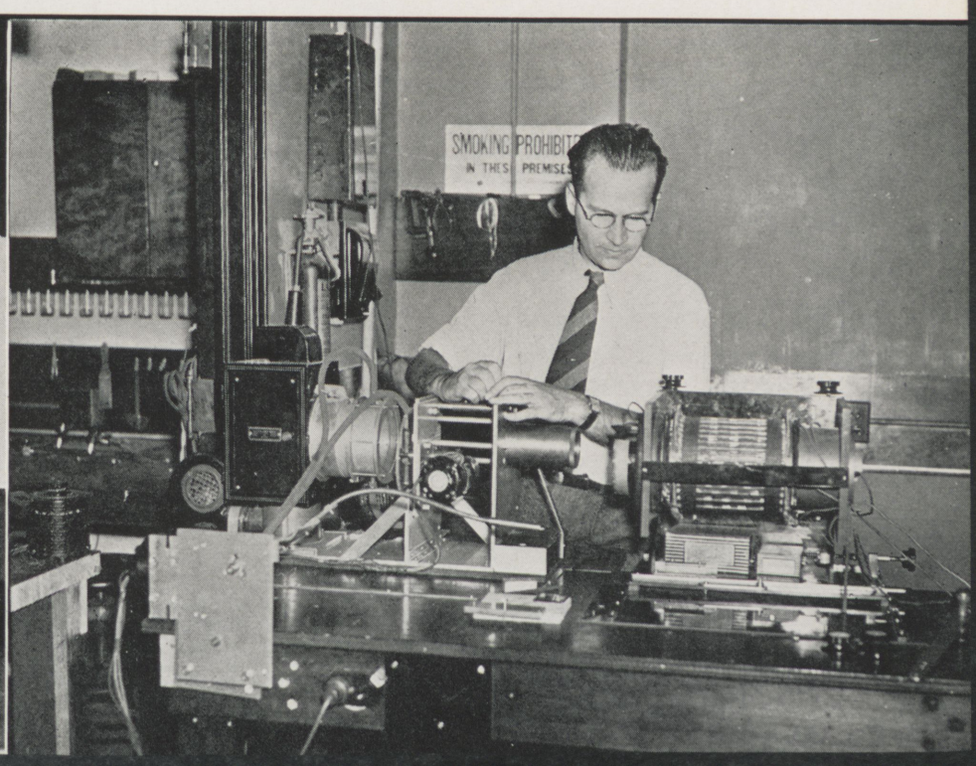
The advantages of this type tachometer are that it imposes no load that might slow even the smallest motor, it can be used in any position, it requires no connections, does not have to be oiled, and contains no wearing parts.

Dr. P. C. Goldmark, left, and J. N. Dyer of the C.B.S. television staff at the film-scanning equipment. The filter disc may be seen in front of Mr. Dyer's right hand

Dr. Goldmark with equipment for projecting images from colored slides. The image dissector is at the right. Kodochrome transparencies were used as subject matter.

Courtesy Electronics





AROUND THE CAMPUS

with John T. Newlin, c.e., '43

Anson Weeks Secured for Military Ball

The Tau Nu Tau Military Fraternity has announced that those who attend the Military Ball at the Mayflower Room, December 7, will be "Dancin' with Anson," for Anson Weeks' famous dance band has been secured for the occasion. Anson Weeks' band has played engagements in the Trianon and Aragon in Chicago and at nationally known spots in New York City. He has been heard over nation-wide radio programs, and Rose is fortunate to have obtained his band for the ball.

The dance is to be open to the public and will be held from nine to one. Basic military students are especially urged to attend the affair. The dance will be preceded by a banquet for members of Tau Nu Tau and their dates.

The following committees were appointed to handle the affair:

Orchestra: Edward J. Klecka and Joe Dreher.

Place: John Bartmess, Fred Wehle, and Quentin Jeffries.

Programs: George C. Harper and George Schull.

Tickets: John L. Combs and Robert D. Phelps.

Advertising: William R. Ringo, Charles A. Howlett, H. Rolland Buell, William D. Schwab, and James E. Shake.

Banquet: John G. Appel, John E. Tracy, and John R. Roberts.

Homecoming—October 26

In accord with last issue's prediction of a bigger and better homecoming celebration for 1940, fate saw fit to grant us ideal weather for the occasion to make the week-end program a complete success. Everyone who attended the festivities and witnessed Rose's brilliant victory over Earlham enjoyed himself.

Early Friday evening, Rosie, Poly's famous mascot, climbed aboard the Terre Haute bound parade for her annual visit to the big city. Having convinced the town that Rose Poly was out to win a football game the following day, the jubilant cavalcade again returned to the campus to pass judgment on the freshman bonfire. This year's creation proved to be a roaring success. The concerted effort of the entire freshman class and half the Public Service Company had resulted in suspension of the traditional privy sixty feet in the air—a new high for this type of heavier-than-air craft. Coach Phil Brown and Captain Harper were called upon to speak, and both dubiously expressed their confidence in a Rose victory the following afternoon. Doughnuts and cider, the R Men's contribution to the party, brought the evening to a refreshing close.

Freshmen, aided by the seniors (both of them), turned out early the next morning to decorate the campus. By noon the job was completed, and everyone settled back to await the gridiron clash with Earlham at two o'clock.

A record crowd attended the game and watched an inspired Rose team avenge a 14-13 defeat at Earlham last year to the triumphant tune of 47-0. An enthusiastic freshman cheering section suddenly found the support of the entire student body as the "Fighting Engineers" completely outclassed a valiant Earlham eleven. Certainly no more fitting climax to a glorious week-end could have been desired.

The Homecoming Dance held that evening in the gayly decorated gymnasium proved to be an appropriate finale to a hectic two-day celebration. Specialty numbers by Jimmy Maxwell's orchestra and a generous supply of confetti added to the gayety of this affair. Everyone who attended, including the faculty members who served as chaperons, was in high spirits, and a fine time was had by all.

The following committees, assisted by the freshman class, which contributed much to the success of this

HOMECOMING BONFIRE

A tribute to the labors of the freshman, the bonfire was one of the best in years, easily visible six or seven miles away.

homecoming affair, deserve great credit for their good work:

General Chairman: William J. Anderson.

Orchestra: James Bartholome, John Tracy.

Decorations: Franklin Cook.

Gymnasium: Ross Pyle, Eldred Beckman, John Wilkerson.

Campus: William Schwab, Dennis McCarthy, Sam McGurk.

Tickets: John Carroll, James Shake.

Programs: J. Arnold Jones, Wm. H. Hales.

Publicity: Fred Wehle, John Kramer.

Finance: George R. Schull.

C.P.T. Gets Under Way

The Civilian Pilot Training Course at Rose has finally got under way after a hectic delay of six weeks in congested government offices in Washington. The first regular class was held Wednesday, October 23, at seven P. M. The bustle and confusion of the national defense program had delayed final government approval of the renewal of the flight course at Rose until this late time.

The ground school instruction covers civil air regulations, navigation, meteorology, theory of flight, and engines and instruments. The flight training is taken at Paul Cox field in Piper Cub planes. After a minimum of eight hours dual instruction the student is permitted to solo.

The following men were eligible for training this year: Robert O. Wright, Fred G. Berghoefer, Lyndon E. Eberly, John G. Mehagan, George D. Blakey, Thomas F. Lane, Thomas E. Douds, Victor W. Tatelman, George A. Boesel, Vincent E. Singer, William D. Prescott, and John W. Anderson. Rose's quota will probably be set at ten students, so not all who are eligible will be permitted to take the course.

Two men who took last year's flight course, John Bartmess and Carlos Moore, are taking the advanced course which is offered at Indiana State Teachers College under the instruction of Professor McDade, a civil engineer. This course leads to a restricted commercial pilot's license and includes practice in flying heavier planes. More complicated maneuvers such as rolls and loops are practiced in the course at State. This advanced course enables a man who desires to enter army flying to go directly to the army training base without any additional primary flight training.

The basic flying course at Rose leads to a private pilot certificate which permits the holder to fly land planes weighing less than 1300 pounds.

"RAMBLIN' WRECKS" TAKE TO THE ROAD

Rose students, under the influence of sophomore Ker, chartered this bus for a trip to Franklin to see Rose win 32-7. Pictured are: David Roach, Norman Pera, Wilbur Seller, Alan Ker, Wayne Shanks, and Bill Anderson.

Tau Nu Tau

Fourteen men were pledged to Tau Nu Tau during the military drill, Monday, October 28. While the band played, the men came forward from the battalion and formed a line in front of the company commanders and the president of the fraternity, William Hales. Quentin Jeffries, secretary of Tau Nu Tau, then directed the men in the pledging ceremonies. Following the pledging, the Rose battalion passed in review before the group of men pledged. The following men were pledged during the ceremonies: Harold E. Bowsher, James R. Brown, Ray K. Chalfant Jr., Marion B. Foley, William M. Hochstetler, Jack K. Kennedy, Donald D. Logsdon, Frederick Nahm, Leon O'Dell, Clay W. Riley, Clifford E. Roberts, Benjamin K. Sollars, Eldon M. Sutphin, and Arlie J. Ullrich.

Class Honors Announced

At a recent assembly Dr. Prentice announced the class honors for the school year 1939-1940. Alan Ker was awarded the bronze Heminway Medal for highest scholarship in the Freshman class of last year. Ker is a mechanical from Indianapolis. His father, Henry W. Ker, is a graduate of Rose in the Class of 1911.

The following men won class honors in the class of '41: Hogan, Buell, Beckman, Barrick, Jeffries, Schwab, Schull, Howlett, Wilkerson, and Tracy. In the class of '42: Kesler, Sollars, Frist, O'Dell, Hess, Brown, and Mehagan. In the class of '43: Ker, Hodgers, Thomas, Irvin, Newlin, Shanks, Percopo, Mott, Wright, Berghoefer, Criss, Prescott, Driskell,

Eberly, and Huggins. All who qualified for class honors had an average for the year of 3.1 or more, counting A,4; B,3; C,2; D,1; E or F, 0.

A. S. M. E.

During the past month two meetings have been held by the local Student Branch of the A. S. M. E. At the first of these meetings William Schwab gave a talk on "Steam Electric Locomotives." After the talk there was an open discussion.

Robert Ringo completed the afternoon's speeches with a discussion of "Piston Ring Coatings and Their Effect on Ring and Bore Wear." A panel discussion which touched upon Mr. Ringo's explanation was then held.

Committees for the coming year were announced at the most recent meeting. The committees are as follows: program committee, all officers; inspection trip committee, Prof. Henry Gray and William Schwab, co-chairmen, Eugene Hess, Benjamin Solars, Bob Young; social committee, John Bartmess, chairman, Donald Logsdon, John Mehagan, Irvin Keeler; publicity committee, James Lohr, chairman, Jack Kennedy, John Vander Veer, Bob Phelps; picture committee, Bob Brittenbach, chairman, William Worley, John Brehaney, and John Carroll.

Professor Carl Wischmeyer spoke on the Charles T. Main award; his remarks were followed by a short talk by Arnold Jones concerning the object of the A. S. M. E. "The Mechanization of the United States Army" was discussed by student member Fritz Wehle.

It was announced that J. Krawetz, who is with the Phoenix Chemical Laboratory, Inc., Chicago, would meet with the local A. S. M. E. on November 5 to talk on the "Petroleum Industry." This special meeting was slated to open with a luncheon at Deming Hall and was open to the Rose A. I. Ch. E. Chapter.

Some time during the first of December Mr. P. C. Ritchie, advertising manager of the Waukesha Motor Company, Waukesha, Wis., will give a talk on the diesel engine in highway transportation with special reference to the Multi-Fuel job. Present plans are to make this a dinner meeting.

A motion was made to award a prize of $5.00 to the Junior student giving the best talk at a local A. S. M. E. meeting.

A. I. E. E.

The first meeting of the Rose Student Branch of the American Institute of Electrical Engineers was held on Tuesday, October 15. All members of the senior and junior classes were present.

Professor Knipmeyer gave an interesting talk on the purpose, organization, and activities of the Institute. A program committee consisting of Schull, Combs, and Gaston was appointed.

On Monday, October 21, Joe Dreher gave a short talk on "Safety and Methods of Resuscitation". Barrick assisted in the demonstrations. The talk was highly interesting and of educational value.

A delegation from Rose attended the section meeting of A. I. E. E. at Indianapolis Wednesday, October 23. The trip included an inspection of the Indianapolis airport and proved to be very interesting.

Registration Day at Rose

Along with several million other Americans the men at Rose eligible for the draft registered October 16. Registration was held in the college office for out-of-town students and teachers. A total of twenty-eight men registered at Rose. Each man gave his address, telephone number, and other general information so that he could be reached in case his name were drawn. One card was filled out to be sent to the man's home town draft board, and another was made for him to carry.

Local men registered in their local precinct voting places. Men who held reserve officer's commissions or who were enrolled in the advanced R.O.T.C. course were exempted from registration.

It has been announced that if a college student's name is drawn for active service, he will not be called until the end of the collge year. It is not known yet whether technical college students will be given special exemptions from service so that they can continue their education.

A. I. Ch. E.

The chapter members are looking forward to an interesting series of activities during the coming season. Two outstanding features have already been arranged. The first feature is to be a joint dinner meeting with the American Society of Mechanical Engineers chapter. In December the juniors and seniors plan to attend the Chicago Chemical Exposition.

On November 5 the chapter is holding a dinner meeting with the American Society of Mechanical Engineers chapter. The speaker will be Mr. J. Krawetz, a petroleum expert, who will talk on the subject "Quality and Adaptability Characteristics, the Basis for the Selection of Petroleum Products". Mr. Krawetz writes for outstanding petroleum magazines and lectures at Northwestern University. He is a chemical engineer and also holds an LL.D. degree.

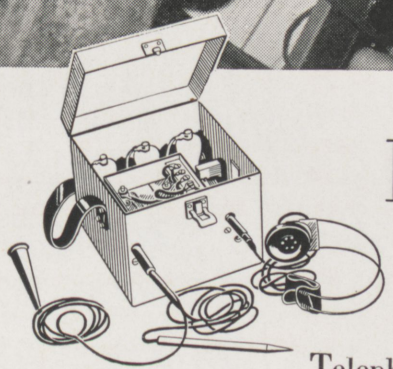
The juniors and seniors of the chapter plan to attend Chicago's first National Chemical Exposition for at least two days. The exposition is to be held for four days beginning December 11. It features the theory and industrial applications of modern chemical methods.

Student Council Positions Filled

With the elections of the various organizations completed, the Student Council now has the following membership:

President of the
Senior class .....Joseph W. Dreher

(*Continued on Page* 24)



Electrical Detective
finds wanted pair

Telephone men know this piece of apparatus as the 108-A Amplifier. It is an "exploring amplifier," which has been developed by Bell System engineers to identify pairs of wires in telephone cables — some of which contain as many as 4242 wires.

The cable man explores this mass of wires with the pencil-like probe. A tone sounding in the headphone tells him when he has found the right pair.

Ingenuity — special equipment — attention to details — play an important part in making your telephone service the clearest and fastest in the world.

Why not report "All's well" to the folks at home? Rates to most points are lowest any night after 7 P.M. and all day Sunday.

AMERICAN TELEPHONE & TELEGRAPH CO. AND ASSOCIATED COMPANIES — BELL SYSTEM

FOOTBALL

edited by Michael W. Percopo, ch.e., '43

Cape Girardeau Teachers 20 Rose 0

On September 27 the Engineers traveled to Cape Girardeau, Missouri, to engage a strong Cape Girardeau Teachers College eleven for their initial night game of the season. The Teachers won the ball game, 20 to 0, scoring a touchdown in every quarter but the first.

Cape Girardeau's effective aerial and ground attack proved unsurmountable for the visiting Engineers. The Teachers scored their first touchdown in the second quarter when Hoeh received a 20 yard pass from Spurlock to put the pigskin on Rose's one yard line. On the next play, Wolfe, Teacher fullback, scored plunging through the center of the line. The conversion for the extra point was good, and the Teachers were ahead 7 to 0.

Again in the third quarter the Teachers scored via the aerial route when Mitchell, left half, passed to Branch from the Rose 31 to account for touchdown number two.

During the third quarter the Engineers offense clicked long enough to enable them to advance the pigskin from their forty to the enemy's 18 at which point they were stopped.

The last quarter saw the Teacher's ground attack begin to roll when they marched from their own 20 to score the last touchdown of the game. Dunham started the ball rolling by making a neat 26 yard run. At the Rose 11 yd. line the locals were aided by a 5 yd. penalty that placed the ball on the 6 yd. stripe. Hails plunged through center to score.

Rose Bows to Evansville

A vindictive Evansville eleven, which had failed to score a point against Rose in their last three encounters, defeated the Engineers 10 to 6 in the curtain-raiser on the Rose Field, October 12, to give the Engineers their first setback in the Indiana Conference race. The defeat somewhat shattered the hopes of Rose followers who were looking forward to a possible championship after Rose's victory over Wabash.

ROSE FOOTBALL SCORES TO DATE

Won—5		Lost—2	
Rose	9	Wabash	7
Rose	0	Cape Girardeau Teachers College (Mo.)	20
Rose	6	Evansville	10
Rose	47	Earlham (Homecoming)	0
Rose	32	Franklin	7
Rose	38	Milton (Wis.)	0
Rose	24	Hanover	0
Total Points	156	Total Points	44

The Aces had only one decided advantage over Rose. That was the brilliant punting of Harold Montgomery, right end, whose booming kicks set Rose back deep into their own territory every time the Engineers got going. The thriller of the game occurred in the final quarter when scrappy "Moose" Bowsher got away for a 63 yard run to score Rose's only touchdown.

Evansville scored midway in the first period from the Engineers 28 yard line by virtue of a poor punt. The ball was downed on the Rose 28 yard line from whence Bailey, Evansville left-half, swept around left end for 15 yards. On the next play Duval behind perfect blocking, crashed through left tackle on a delayed buck and galloped 13 yards to score the touchdown. Armstrong's conversion was good, making the score 7 to 0.

No scoring occurred in the 2nd and 3rd quarters, but Evansville opened the 4th quarter with a rally which eventually led to a field goal. Starting from their own 35 yard line, the Aces advanced the ball to midfield from where Yabroudy ran around left end for 22 yards. Duvall and Waggoner, alternating, brought the ball to the Rose 21 stripe for another first down. At this point the Engineers defense stiffened forcing Charley Armstrong, Ace's left guard, to attempt a field goal on the fourth down. The kick was perfect, giving Evansville a 10 to 0 edge.

After an interception of a pass by Duvall intended for Bowsher, Montgomery kicked from his own 31 to the Rose 37. Bowsher, carrying the ball through left tackle, broke clear on a cut back to make the sensational run of 63 yards. Harper's conversion for the extra point was a bit too wide.

Rose had two other scoring chances but they did not materialize. In the first quarter Bowsher recovered a fumble on Evansville's 35 yard, but his efforts went to waste when an attempted pass by Michaels was blocked and recovered by an opponent. The second scoring chance occurred in the 3rd quarter when Al Klatte returned a punt 30 yards to put the ball on Evansville's 20 yard line. The drive was stopped, however, when Goebel, Evansville's right end, intercepted a pass.

Rose Vanquishes Earlham 47-0 at Homecoming

Much to the satisfaction and delight of the "Old Grads" and the student body, the Rose Poly Fighting Engineers vanquished the favored Quakers from Earlham on a sweltering "Homecoming Day" in such a fashion as to leave no doubt in the minds of the spectators as to who was the victor. The score was 47 to 0. Rose scored one touchdown in the first period, three in the second, and three in the fourth.

After a one week layoff the Engineers came back to put on a swell exhibition of football for the alumni. Passes clicked, the running attack clicked, and the defense stood up like a stone wall. With Captain Harper forced to the side lines because of a bad leg, Ray Hogan, tackle, was called upon to do all the punting and place kicking. Evidently he did not do a bad job even though it was the first time he attempted to kick in a game. He accounted for four conversions and kept the enemy well in their own territory with his punts.

The Engineers got underway immediately in the first quarter. They advanced into Quaker territory a few minutes after the opening gun and attemtped a field goal from the Earlham 26 yard line which was a bit too low. But this stopped the Engineers march only momentarily. A few minutes later Walters received an Earlham punt on his own 45 which he returned four yards. At this point Coach Brown sent in four substitutes. On the next down Earl Michaels made a quick pass to Bowsher on a brilliant slicker play. Bowsher went to the Earlham 10 yard line before he was brought down. From there Michaels passed to Joe O'Connell in the end zone for the first tally. Hogan's conversion was perfect.

The second procession down the field began when Michaels intercepted a pass intended for a Quaker. Some fancy ball carrying by Klatte and some fine slinging by Michaels advanced the ball to the 3 yard line just as the first period came to a close. No time was lost, however, as Klatte on the first play in the second period plunged through for another touchdown. Ray Hogan toed the pigskin for another perfect convension.

The stage for the next touchdown was set when Hogan punted to Ortwein, Quaker safety man, who fumbled and recovered on his own goal line. Ortwein retaliated by kicking to Klatte who received the ball on the Quaker's 30 and returned it to the 21. From there Bowsher scrambled off tackle and scored touchdown number 3.

Charlie Meurer's fine pigskin carrying contributed greatly to Poly's final touchdown in the first half. Starting from his own 34 yard line he gained consistently to advance the ball to the Earlham 21. After three unsuccessful plays Michales flipped to Meurer on the 10 yard line for a first down. On the next play Klatte scampered for the remaining 10 yards to score the 4th tally.

The third quarter was scoreless with both teams playing heads-up ball. It was only in this quarter that the Quakers came within scoring distance. Their drive toward the goal began when DeHoney recovered a Rose fumble on the Engineer's 30 yard line. Wright, Earlham right half, rifled a pass to Garoffolo, who was brought down on the 10. This was the nearest they ever got to the goal line for on the next play Jim Brown, Rose secondary man, snatched a pass intended for DeHoney and ran it back to the Earlham 39 yard line.

The final quarter opened with the Engineers on the Earlham 19 as the result of some fine ball lugging by Bowsher. Bowsher and Klatte alternated to put the pigskin on the 6 yd. stripe from where Klatte went over for the 5th tally. Hogan's kick for the extra point was good.

Rose shows rare blocking form on this play against Earlham at the Homecoming game.

Cavanaugh's interception of a Quaker pass on the Earlham 20 yard line set the stage for the 6th touchdown. After two line plays netted 5 yards, Michaels flipped to Bowsher in the end zone for another six points. Hogan's conversion for the extra point made the score 40 to 0.

The last touchdown came about as a climax to the entire game. With less than one minute to play Wagner punted to Klatte on the Earlham 48. Al fumbled momentarily and then sped along the north side of the field to score standing up. Charlie Van Meter's kick for the extra point was good.

Rose Defeats Franklin 32 to 7

Disproving any theories that their rampaging victory over Earlham was just a matter of luck and freak play, the Rose Poly "Fighting Engineers" traveled to Franklin, Ind., November 2, to hand the Grizzlies of Franklin a 32 to 7 defeat. The majority of the freshmen class, accompanied by the venerable "Rosie", attended the game. This was the first instance that "Rosie" has left home to attend a game.

Franklin, which has yet to win a game, managed to prevent Rose from scoring in the first period. Rose, however, did threaten once when they were on the Franklin one yard line.

Rose got underway to scoring in the second period when a running attack in combination with several passes put the ball on Franklin's 2 yard line. Al Klatte plunged through the line to score. Charlie Meurer's fine ball carrying set the stage for the second touchdown in the same period. This time Klatte scored from the 5 yard line to make the score 12 to 0 in favor of Rose.

After this touchdown Franklin came to life to put on a running attack slashing the Engineer's ends and tackles. They advanced the ball to the 5 yard line from where Carter scored. Starr's kick for the extra point was good. The scoreboard at the half showed Rose leading 12 to 7.

In the third quarter the Engineers added two more touchdowns to their string. Jim Brown, who did some fancy ball carrying, hit pay dirt on a short plunge to score the first touchdown. Earl Michaels, the fellow who does all the passing for the team, scored his first six points for Rose when he galloped 15 yards on a fake pass to score.

In the last quarter, the Engineers unleashed their passing attack in blitzkreig fashion. Michaels passed to Jim Brown from the Franklin 20 to account for the final touchdown of the game. Ray Hogan converted for the extra point.

Klatte High Scorer in Indiana Conference

At this writing Al Klatte, stalwart fullback of Rose, is leading the Indiana Conference for individual honors with a total of 60 points. Third place Steve Juzwik, Notre Dame halfback with 43 points, is Klatte's nearest competitor since Pete Varini, of St. Joseph's College, has already completed his season with a score of 54 points. Juzwik has two more games to play in, Northwestern and Southern California, and his chances of scoring enough points to overtake Klatte seem improbable.

Klatte began his scoring spree on October 26 when he scored four touchdowns against Earlham College. He continued his spree with two counters against Franklin College, and on Armistice Day, with Milton College at Rose, he tallied twice more, to total 48 points in three games. This brought him to second place behind Varini, and against Hanover in the last game on the Rose field, with the team feeding him the ball at every opportunity, Klatte scored twice more to gain first position with 60 points.

Al, who is reputed to be one of the State's shiftiest ball carriers, is only twenty years old and tips the scales at only 159 pounds.

"Rosie", the college mascot, made the trip to Franklin by truck with a freshman escort to see the team win a conference game.

GRADE A GRADS

edited by Gene F. McConnell, m.e., '42

Harry A. Schwartz

Like many Rose alumni, the subject of this month's word-portrait has a definite right to carry his thoughts back to "My Old Kentucky Home." Dr. Harry A. Schwartz was born in Oldham County, Kentucky, on April 13, 1880 and was educated in the Louisville public schools, graduating from Male High School. He was graduated from Rose in 1901 with a B.S. degree in electrical engineering.

After holding a position with the Louisville Railway Co., he was an instructor in his alma mater, 1901-1902, and resigned to be employed in the Indianapolis works of the National Malleable and Steel Castings Co. Since 1920, Dr. Schwartz has been the manager of research for the latter company at Cleveland. Although considering all of the tasks that have come his way as having been interesting, he thinks the defense of his company in a law suit in Federal Court was the most interesting. On June 22, 1918, he was married to Alice Joy Hill in Indianapolis.

In addition to M.S. '03, M.E. '05, and Ch.E. degrees, Dr. Schwartz has been the recipient of two honorary degrees, Sc.D. '33 and an Hon. D. Eng. from the Case School of Applied Science. He is also a member of Sigma Xi. The fact that he has about ten patents dealing with malleable processes to his credit indicates great success in his present position. He is the author of a book on metallurgy entitled "American Malleable Cast Iron." Dr. Schwartz is a member of the A. F. A. (Penton Medal, 1931); A. S. M. E.; A. I. M. M. E.; A. C. S.; A. S. T. M.; and A. S. M.

His hobbies along engineering lines are thermodynamics and mathematics as applied to metallurgy. Others include foreign affairs, travel, amateur movies, and opera. He is a member of the University Club of Cleveland.

The ideas of this prominent alumnus on successful living seem to be especially pertinent at this time. They consist of "Finding the kind of work which will make earning a living a *pleasure,* and being not too much disturbed over income."

Dr. Schwartz maintains close contact with Rose and at present is an alumni representative on the Board of Managers. He was recently chosen to represent the Institute at the formal inauguration of Dr. Howard Landis Bevis as president of Ohio State University, Columbus, on October 24 and 25.

Photo by Greystone Studios, Inc.
Dr. Harry A. Schwartz
Class of '01

Homecoming

October 26, 1940, must be marked down as a red-letter day in the history of Rose Homecomings.

If the grads came back to see a magnificent bonfire, they saw one.

If they wended their way back to dear old Rose to witness one of Rose's greatest football teams come through with a smashing victory, they were not disappointed.

If the alumni turned their footsteps in the direction of their alma mater to renew old friendships and enjoy a gala homecoming dance, they must have been glad they came.

From the opening ramble around the city, through the "Fighting Engineers'" superb display of power, to the merriment of Saturday evening, success was the keynote.

Regardless of the motivating force, the following is a partial list of those who came back:

'86 Foltz, Herbert W.

'01 Schwartz, Harry A.

'03 Cushman, John A.; Pine, Benjamin H.

'06 Turk, Paul (Ex.); Wischmeyer, Carl.

'08 Lammers, Charles N.; Schmidt, H. Earl; Stock, Orion L.

'09 Klatte, Ernest W.

'10 Butler, Arthur G.; Webster, Wm. Henry.

'11 Shook, Wilbur B.; Wimsett, Harold O.

'12 Schoonover, Ralph R.

'13 Gray, Chesleigh.

'14 LeForge, Charles C.; Schopmeyer, George E.

'15 Gwinn, Lawrence D.

'17 Gray, Henry C.; Toelle, Harry A.

'18 Combs, Bert L.

'20 Osmer, Walter L.

'21 Biller, Ray L.; Minar, Samuel J.; Tilley, Robert L.

'22 Pittman, Sterling H.; Scott, Malcolm C.

'23 Connelly, James B.; Donham, Edward F.; Griffith, E. Miles; Quinlan, Leonard F.

'24 Bogardus, Franklin F.; Forsythe, Samuel S.; Simms, Carson W.

'25 Gosnell, Everett C.; McDargh, C. Derby; McIntosh, W. Roscoe; Merrill, Hubert H.; Moorhead, John W.

'27 Wilson, John B.

'29 Markle, Richard T.; Moench, Herman A.; Thompson, David L.

'30 Sperotto, Joseph J.

'31 Biller, Richard E.; Blake, Anthony G.; Richardson, John F.

'32 Ahlers, Albert L.; Froeb, Paul F.; Smith, P. Arvard; White, Howard L.; Wilson, Robert A.

'33 Bradfield, Merrill L.; Creedon, Joseph B. (Ex); Phelps, John M.; Powell, Russell A.; Skinner, James C.

'34 Foulkes, Jack H.; Mason, James I.; Updike, Ronald W.

'35 Bradley, John A.; Brinkman, John F. (Ex.); Cody, Emmet J.; Heck, Louis W.; McEowen, Albert V.; Nelson, Carl; Pearce, Bert L.; Richardson, Harry H.; Shaw, Virgil E.; Terhorst, P. Byrne; Trusler, Nelson B.; Welsh, Ernest J.; Welsh, John H.

'36 Bennett, Paul D.; Cavanaugh, George E.; Creal, William R.; Denehie, Edward B.; Mewhinney, Albert B.; Newton, E. Kendrick; Overholser, C. Daniel.

'37 Carroll, Lawrence B.; Foley, Alden B.; Lotze, Albert; McCullough, Donald; Sears, Robert I.; Snedeker, Walter R.

'38 Alexander, Wayne E.; Cantwell, Charles E.; Dillahunt, Joseph A.; Dispennett, Robert W.; Eckerman, Edward H.; Hayes, John R.; Lundgren, Clemens; Pearce, Robert; Stanfield, Max L.; Wittenbrock, Norman G.; Wolf, William D.

'39 Altekruse, Richard D.; Doenges, Franklin G.; Forsyth, J. Lamont; Fuller, Charles G.; Noel, William M.; Peterson, Victor K.; Pies, John R.; Powell, Richard W.; Ross, J. Ewing; Smith, George W.; Spahr, Edward O.; Steele, Malcolm A., Jr.; Wise, Randall H.

'40 Colwell, Robert H.; Fleming, Maurice C.; Heltsley, John H., Jr.; Hosack, Milton M.; Kelsall, Avery C.; Lucas, Willis R.; Mitchell, Max L.; Montgomery, D. Chancellor; Quinn, John W.; Rustamier, Jack (Ex.); Smilanic, Nick; Whitehouse, Vernon E.; Wilson, Allen T.; Zehnder, Walter T.

'41 Rynick, William T. (Ex.)

'42 McCormick, York (Ex.); Miller, Robert (Ex.); Rose, Irvin (Ex.).

Departed

Word has been received of the sudden death of Mr. Walter H. Martin on July 26, 1940. Mr. Martin received his B. S. degree in civil engineering from Rose in 1897 and at the time of his death was a consulting engineer in Danvile, Ill.

Mr. James Dale was stricken fatally with a heart attack on Wednesday, October 2, 1940, at his home in Plymouth, Michigan. Mr. Dale was vice-president of the George H. Beach Co., Inc., in Detroit. He is survived by his widow, Helen C.; a son, James Jr.; a daughter, Jeannette Wachter; three step-sons; and three grand-children.

Mr. Arthur C. Hansen, '14, assistant manager of the Republic Steel Corp'n. plant in Mineville, N. Y., died suddenly on November 12, 1939.

The Grads Advance

'92 Mr. Herbert B. Sperry, '92, suffered a stroke of paralysis in July and is still seriously ill. Mr. Sperry has retired from his position as engineer of design and mfg. with the Appleton Mfg. Co. in Batavia, Ill.

'97 Maurice C. Rypinski has retired from active business and is living as 1221 Stone Canyon Road, West Los Angeles, Calif. He is maintaining several business interests.

'10 Joseph V. Davidson is employed as a refrigeration engineer in Atlanta, Georgia. His new address is 1362 West Peachtree Street.

'11 David J. Johnson is superintendent of the Leonard Construction Co. of Chicago.

'15 Edward J. Hegarty is employed by the Westinghouse Electric and Mfg. Co. as director of sales and is located at Mansfield, Ohio.

'18 Robert P. Long, with the Wabash Ry. Co. at Montpelier, Ohio, was awarded the degree of Bachelor of Laws by LaSalle College in June, 1940.

'19 Frederick M. Crapo, formerly vice-president and general manager of the Indiana Steel and Wire Co. at Muncie, is now president of that company.

'22 Kearney E. Harmas, with the Illinois Bell Telephone Co., is now division employment supervisor.

Leroy A. Wilson is a rate engineer with the American Telephone and Telegraph Co.

Deleon A. Young has been transferred to Houston, Texas, as operating superintendent for the Sinclair Refining Co.

'23 Robert O. Cash is employed by the du Pont Co. as assistant manager in Denver, Colorado.

Clyde G. Raeber is valuation engineer for the Appalachian Electric Power Co. at Huntington, West Va.

'26 E. Wayne Watkins, with the U. S. Engineer Office, has been transferred to Los Angeles.

'27 Davis U. Hoffman is stationed in Washington, D. C. in the U. S. Engineer Office.

'28 C. Everett Sieglin is general foreman of the electrical department in the Wisconsin Steel Works.

'29 Allen W. Reeves, with the Illinois highway commission, has been transferred to Decatur.

David L. Thompson is employed by the Northern Ind. Public Service Co. at Hammond.

Andrew H. Davy, who has been with the Quaker Maid Co. in Brooklyn, has been promoted to the engineering department of the parent company, the Great Atlantic and Pacific Tea Co., in New York.

'30 Russell E. Martin has a position with the Bell Telephone Co. at Alton, Illinois.

'32 Albert L. Ahlers has been called to active duty in the U. S. Army at Charlestown, Indiana.

T. Wayne Bovenschen is superintendent of the Delmarna Brewing Co. at Wilmington, Del.

Robert M. Clark, with the National Tube Co., has been made electrical engineer of the Christy Parks Works and moved to McKeesport, Pa.

Paul J. Ogden has a position with the State Highway Commission at Vincennes.

'33 Robert L. Barr is president of the Barr Manufacturing Co., Inc., in Chicago.

Charles F. Schilling is employed by the Federal Ordnance Works at Charlestown, Ind.

Edwin J. Withers is assistant engineer in the Rural Electrification Administration at Washington, D. C.

'34 Noble C. Blair is in Washington, D. C., called to active duty in the U. S. Army.

Brent C. Jacob is special assignment man in production routing and planning in the Chrysler Corporation.

Jack H. Keller has taken a position with the du Pont Co. at Charlestown, Ind.

'35 Robert B. Asbury is flight instructor, U. S. Air Corps, Basic Flying School, at Randolph Field, Texas.

'36 Raymond J. Harrod, with the Pennsylvania R. R., is to be transferred to New York on Nov. 1.

Charles E. Macdonald is working on preliminary design and layout of airplane engines for the Menasco Mfg. Co. of Burbank, Calif.

Carroll R. Merriman is assistant supervisor for the Pennsylvania R. R. at Steubenville, Ohio.

'37 Frank E. Blount is a student engineer with the Willamette-Hyster Co. in Portland, Oregon.

Thomas N. Wells, with the International Business Machines Corp., is office manager at Fort Wayne, Ind.

'38 Jack F. Shake is employed by Ben Burk, Inc., in Terre Haute.

'39 Gaylord L. Barrick is a graduate assistant at Purdue University, working on his Doctor's degree.

Christopher P. Stark is a graduate student in chemical engineering at the University of Iowa.

'40 Norman G. Eder, with the General Electric Co., has been transferred to Schenectady and is living at 536 Thompson St. with Maurice W. Cannon, '40.

Maurice W. Johns is a test operator with the Allison Engineering Co. at Indianapolis.

Willard V. Louthen is a graduate student in meteorology at the University of Chicago.

Richard A. Mullins has been transferred to Huntington, West Va.

Les Enfants

Mr. and Mrs. Paul R. Smith are happy to announce the birth of Richard Morgan Smith on October 2, 1940. The father was graduated from Rose in 1934 and is employed by the Commercial Solvents Corp'n. in Cincinnati.

STUDENT COUNCIL

(*Continued from Page* 16)

President of the Junior class .....John G. Mehagan
President of the Sophomore class .....Charles E. Huggins
President of the Freshman class .....Richard C. Ellsworth
Rose Technic .....Charles A. Howlett
Modulus .....John G. Appel
Rifle Club .....William G. Leedy
Radio Club .....John E. Tracy
Glee Club .....John F. Carroll
Debate Club .....Hulit L. Madinger
Camera Club .....Lewis McWilliams
Athletic Association..Albert L. Klatte
Financial Secretary....John L. Combs

The president of each organization on the campus is automatically a member of the Student Council.

A. S. C. E.

The October meeting of the Rose student branch of the American Society of Civil Engineers was held Wednesday, October 30. Professor Hutchins presented an interesting paper prepared by the T. V. A. concerning rainfall prediction and meteorology.

At the meeting the student members who had worked at jobs pertaining to civil engineering during the past summer explained their work to the chapter members. The secretary, R. King Chalfant, reported nearly 100% membership in the chapter at Rose.

Debating

The Debate Club held its first meeting of the current school year on Thursday, Oct. 31. Mr. Brown,

the faculty adviser and coach, explained the purpose of the organization to several new members interested in trying out for the teams. If the number of men present at this meeting is any indication, it would seem as if more interest than usual is to be manifested in oratorical endeavors this year.

The question to be discussed this season is as follows: "Resolved: That the nations of the Western Hemisphere should form a permanent union." Needless to say, this should form the basis for some excellent bursts of eloquence.

Mr. Brown outlined a tentative schedule of intercollegiate debates, and serious work on the question will begin shortly. Anyone interested in the activities of the club is cordially invited to attend the next meeting, notice for which will be posted.

BEHIND THE 50,000

(*Continued from Page* 6)

built into the wings. They are located near the fuselage and are used to lower the landing speed of the plane. Either hydraulic or manual means of raising and lowering the flaps is provided. In most cases both methods are employed as a precaution against failure.

Retractable landing gears are constructed in two general types, the vertical lifting and the hinged horizontal lifting. In the former the wheels are mounted on collapsible struts which are operated by pneumatic cylinders to lift the wheels vertically into recesses located in the wings or motor nacelles. The latter type employs a hinged, rigid strut on which the wheel is mounted. This is folded outward and upward into recesses in the wing.

Several new planes are equipped with a third wheel that makes landing of the plane safer and easier. This landing gear is similar to the tricycle gear used on many of the first airplanes and discarded as redundant until the use of retractable wheels became prevalent. Through the use of retractable gear wind resistance is reduced and speeds increased.

American engineers are now producing planes capable of speeds in excess of 400 miles per hour through the application of principles of aerodynamics. If these planes or newer planes can be made suitable for construction by the mass production methods employed in the automotive industry, the expansion of the United States flying forces can be accomplished in a minimum of time.

Fraternity Notes

Lambda Chi Alpha

Theta Kappa Zeta of Lambda Chi Alpha has experienced considerable success with its new house and, in view of present prospects, has every right to believe that this success can not only be maintained but also increased in the near future.

Initiation services were held for three men on Friday evening, October 25. These services were open to alumni of this Zeta, who dated back to the time when the Zeta was known as Indiana Gamma of Theta Kappa Nu. The services were held at that time for the convenience of those alumni who attended homecoming at Rose. The new initiates are: Frank Jones, James March, and Leon Brodsky.

Thomas Lane and Frank Jones have been appointed to the positions of manager and assistant manager, respectively, of the Rose Tech Rifle Club. These two men both have maintained consistent high scores in the matches in which they have particpated.

James Pate, our potential transfer from Eureka, has withdrawn from Rose and has passed preliminary examinations preparatory to his entrance into the Army Air Corps. Jim has created several friendships in the short time he was enrolled, and it is with regret, and best wishes for him, that we see him leave.

Harry Halberstadt, a former member of this Zeta, is now an instructor with the army air corps. We wish to congratulate Harry.

Sigma Nu

The plans made for Homecoming by the Sigma Nus met with great success. The ball was started rolling Friday night with an open house planned by Fred Bradshaw, John Wilkerson, and John Kramer. The appearance of the house was very pleasing thanks to the efforts of Fred Bradshaw and his girl friend. The rooms were decorated in Hallowe'en style with orange and black crepe paper and corn shocks. During the evening games, dancing, and technicolor lantern slides, taken and shown by Fred Bradshaw, were enjoyed. The party was chaperoned by Prof. and Mrs. E. A. MacLean, and Lt. and Mrs. Paul Bennett. All of the actives and pledges were present and many came back to join in the activities. Everyone present had a very enjoyable evening.

Saturday night at seven o'clock the chapter members and alumni gathered at the Castle Roma to eat before going to the Homecoming dance. After the dance many alumni returned to the house to talk over the good times they had had during their days at Rose.

Beta Upsilon chapter of Sigma Nu is very pleased to announce the pledging of Norman J. Pera. Norm is a sophomore civil engineering student from Gary, Indiana.

Plans are being made for a hay-ride which is to be held on Saturday, November 9th. After the excursion there will be dancing and the usual activities at the house.

Theta Xi

Kappa chapter of Theta Xi started its social season early in October with a hay-ride. This was followed by an elaborate homecoming program which was enjoyed by many alumni as well as active members of the chapter. Highlights of the three-day program included an open house Friday evening and a smorgasbord Saturday night preceding the Homecoming Dance.

The Chapter is pleased to announce the recent pledging of Eldred Beckman of Chicago, a senior in the mechanical engineering department. Eldred was one of three seniors to be pledged by Tau Beta Pi this fall. Theta Xi is further represented in

this organization by president Ray Hogan.

In the recent class elections Brother George Harper was elected vice president of the senior class, and Brother Willys McCloud was elected vice president of the junior class. Brothers Al Klatte and Fred Nahm, and Pledge Lyn Eberly were elected senior, junior, and sophomore athletic representatives respectively. Brother Klatte was also elected president of the Student Athletic Board and vice president of the Student Council.

Improvements about the house continue under the able leadership of House Manager Jack Vander Veer. The kitchen has been repapered and painted, and a new refrigerator has been purchased

Plans are under way for a formal dance to be held before Christmas vacation. Social Chairman Fred Wehle is in charge of arrangements.

Alpha Tau Omega

Gamma Gamma chapter is very happy to announce that nine men were initiated into the fraternity at formal initiation ceremonies held Sunday, October 13. The chapter wishes to congratulate the following men on their initiation: J. Arnold Jones, '41, of Terre Haute; James Brown and William Hochstetler, '42, of Terre Haute; Jack Nicholas and Alan Ker, '43, of Indianapolis; Richard Raab, '43, of Brazil; and Warren Loudermilk, John Metz, and George Mitchell, '43, of Terre Haute. The chapter is also glad to announce that Frederic L. Kolb, '43, of Terre Haute is now an ATO pledge.

ATO held an alumni reunion and smoker at the chapter house after the homecoming football game with Earlham. Many alumni were here for the homecoming celebration, and the chapter was indeed happy to have such a large number of its alumni back at the house again.

The chapter held its first social function of the year in the form of an open house on Saturday, September 19. Chaperones for the party were Captain Henney and Lieutenant and Mrs. Bennett. Cards, ping-pong, and dancing were enjoyed by those present.

On Sunday, October 6, eight men attended the state conclave at the Delta Alpha chapter house at Indiana University. At this conclave plans were formulated for the annual state dance which will be held in March at the Hotel Claypool in Indianapolis.

We wish to congratulate Joseph Dreher and John Mehagan who were elected Senior Class and Junior Class president respectively. Congratulations are also due James Brown who was pledged to Tau Beta Pi and initiated November 7.

Did You Know That?

By most people it is supposed that when a man gives a girl his pin it means at least that his intentions are of a future engagement. A man's fraternity usually means everything to him, and if he gives a girl its official pin he must think a great deal of her. —*Emily Post*

SLY DROOLINGS

edited by Ralph E. Brown, m.e., '43

Dick Driskell was taking a lovely little blonde home after their first date. Upon reaching the end of the walk she murmured good night and hurried up the steps. Dick hurried right along and when they reached the front door, he asked:

"Say, do you know Phil Brown?"

"I don't think I do." she answered.

"Well you ought to. He could use a good sprinter on our track team next spring."

Editor's Comment—We could have had just as good a joke and used much less space by putting a period after "blonde" in the first sentence.

Just before the 1929 stock market crash, a young man married the homely daughter of a millionaire stock broker. Now he's left holding the hag.

J. Arnold Jones now calls his daughter "Weather Strip" because she will keep him out of the draft.

Dr. Sousley: "Where were you yesterday?'

Metz: "Stop me if you've heard this one."

"Did you knock on that traveling salesman's door and wake him as I told you to do?" inquired the boarding house lady.

"Yes'm," replied the maid fresh from the country. "But he didn't wake up, so I finally had to go in and shake him."

"Good heavens don't you know better than to ever go into a traveling salesman's room?"

"Yes'm," responded the new maid, "I do now."

Wichita Eagle

The difference between a model woman and a woman model is that one is a bare possibility and the other a naked fact.

News Item. "A Topeka woman escaped from the police the other night by slipping out of her pajamas. This proved to be a fatal mistake, however, as it made it easy for the police to trail behind."

Some boys in Kansas City were showing a Texas rancher the city. "What do you think of our stock yards?" they asked him.

"Oh, they're all right, but we have branding corrals in Texas that are bigger," he said.

That night they put some snapping turtles in his bed. When he had turned back the covers, he asked what they were.

"Missouri bed bugs," they replied.

He peered at them for a moment. "So they are," he decided. "Young uns, aren't they?"

A wayward gentleman arrived home safely enough but in negotiating the front steps somehow smashed the bottle in his hip pocket. Several minor cuts were the result.

Eventually he made his way into the bathroom, removed his clothes, and applied adhesive tape to his wounds. Then he got into bed without arousing the household.

"So you were drunk again last night," was the startling good morning he received from his wife when he came down for breakfast.

He denied the accusation with vehemence and managed to appear somewhat hurt at the injustice of the world.

"If you weren't drunk," his wife said in an icy voice, "perhaps you can explain why you stuck all that adhesive tape on the bath room mirror."

We know a girl who has a seven-day kiss. It makes one weak.

When a fellow has a heavy date, he doesn't want it light!

Penitent Motorist: "I'm sorry I ran over your hen. Would a half dollar make it all right?"

Agrarian: "Better make it a dollar, mister. I've got a rooster that's very fond of that hen, and the shock might kill him."

Burglar: "Please let me go, lady. I've never done anything wrong."

Old Maid: "Well, it's not too late to learn."

Captain, to beautiful young thing: "Remember, if anything happens on this trip I want you on my raft."

J. W. Anderson says: "My new convertible (a 1914 Model T) runs a little way and then stops—it's a spurt model."

FRAMED

When a girl is as pretty as a picture lots of fellows would like to put her up.

Then there was the guy who got thrown out of his apartment when the landlady heard him drop his shoes on the floor twice.

The latest rage is the miniature cocktail—one drink and in a miniature out!

Sambo: "You know every time ah kiss mah wife she closes her eyes and hollars?"

Rastus: "Ah say she does."

Sambo: "What's dat, Nigger?"

Rastus: "Ah say, do she?"

—The Missouri Shamrock

You can tell a king by the crown on his head,
You can tell a monk by his hood,
You can tell a babe to keep her mouth shut,
But it won't do a d—n bit of good.

Ball State News

G-E Campus News

"HITHER, MOUNTAIN!"

IT'S been centuries since Mahomet resigned himself to go to the mountain because the mountain wouldn't come to him. If Mahomet were living today, he wouldn't have to go to the mountain, that is, if he were at Shasta Dam—the second largest concrete dam in the world—now under construction in California.

There the world's longest conveyor belt is moving mountains—5,700,000 cubic yards of concrete and 10,400,000 tons of sand and gravel—from the processing plant to storage piles near the dam site, a distance of 9.6 miles.

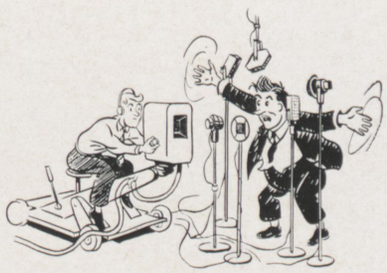
Driving the conveyor belt are General Electric motors and control, thoroughly checked and tested before going on the job by young student engineers taking the G-E Test Course. J. A. Jackson, Va. Poly. Inst., '00, and R. F. Emerson, Yale, '06, had charge of the engineering at Schenectady, and A. W. Moody, U. of Calif., '36, followed engineering on the job. All three are ex-Testmen.

SUPER STREAMLINING

IN this modern age practically every means of transportation is streamlined—automobiles, airplanes, trains, and even baby carriages. The closest approach to perfect streamlining, however, is probably not found in any one of the foregoing but in a General Electric steam turbine, where nozzles must be designed to direct steam at the buckets at just the right angle.

G-E engineers have streamlined turbine nozzles to a point where they absorb less than two per cent of the velocity energy of steam traveling through turbines. Working with models, engineers about 20 years ago found they could feel low-pressure spots in an air stream blown through nozzle sections. Literally and figuratively they were "putting the finger" on streamlining deficiencies. Now, in a special laboratory, air is forced through model nozzles at a terrific speed (more than 700 miles an hour) while mechanical "fingers" feel for points of eddy or friction loss, and an automatic machine records the results.

These "streamline" tests, conducted by young student engineers "on Test" under the direction of experienced engineers, give records of inestimable value in the constant search for new ways to build more efficient turbines.



SIX VOICES

PEOPLE who have qualms about broadcasting probably would have passed right out if they had been in the shoes of George A. Mead, N. Y. State Commander of the American Legion, when he broadcasted recently from General Electric's television studios at Schenectady, N. Y.

For the first time in history a voice was carried over every practical means of voice communication. Mead's talk, in addition to going out on the ultra-short-wave band accompanying the picture on television, was simultaneously carried by WGY on long-wave radio, WGEO on short-wave, W2XOY on frequency modulation, and by light beam and ordinary telephone. In all, six distinct frequency bands carried his words to the four corners of the earth.

Directors of this unusual broadcast were John Sheehan, Union, '25, manager of G-E short-wave broadcasting, and J. G. T. Gilmour, Union, '27, program manager of G.E.'s television station, W2XB.

GENERAL ELECTRIC

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