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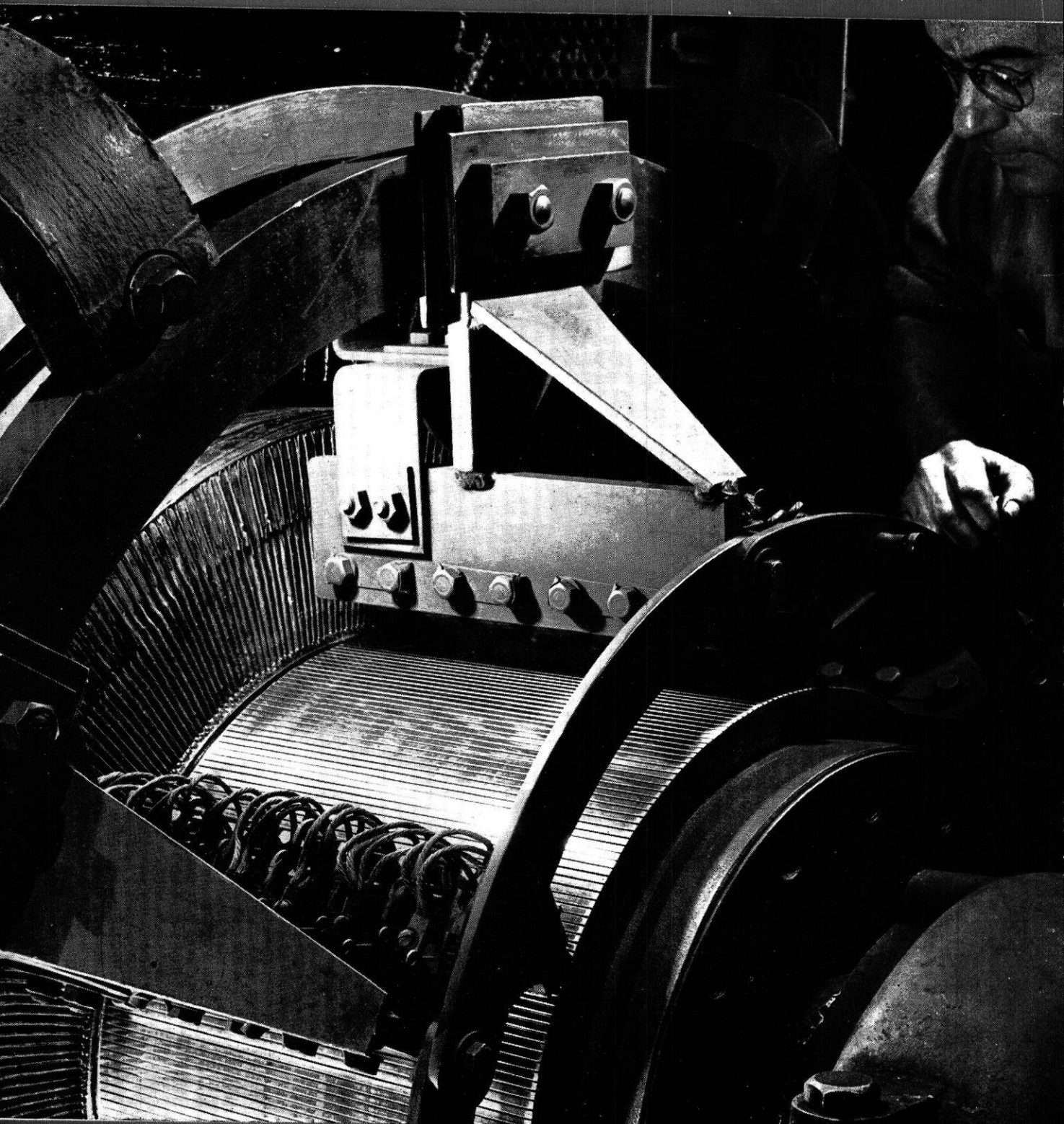
WISCONSIN ENGINEER

December, 1945



BEP — ENGINEERING — COLLEGE — MAGAZINES

To The

YOUNG ENGINEERS OF AMERICA

To those young engineers who are in the service—those who are at the drafting boards of industry—those who are preparing themselves for the engineering profession:

The "good-will" which attaches to a good name or trade-mark has often been appraised at many millions.

For the public places reliance and trust on those names which down through the years have proved they will faithfully reward that confidence.

The products the public trusts are the ones they buy. Where their heart is—there their business follows.

Such a tremendously valuable asset is not built up overnight. It comes only after arduous years of toil—of many disappointments—many triumphs and achievements. And once attained—an equally strong and effective effort must be constantly maintained to guard and protect the reputation thus earned.

Quality of the product—standards of workmanship—must be kept at the highest possible level—in line with the famous name which it bears. Performance in the hands of the user must live up to the highest standards he has been led to expect.

Industrially, one of the great names in America—a name recognized for its foresight, courage, progress and leadership, is the name Timken. The whole world moves forward on these advanced products.

You'll do well to learn the many benefits of Timken Bearings. For Timken Bearings have indeed been of prime importance in making life easier, smoother and better for all humanity.

The Timken Roller Bearing is one of the basic factors which made possible the efficient performance of our huge war machine. It will be vitally important to our vast peacetime economy at which the whole universe will marvel.

In addition to Timken Bearings there are Timken Alloy Steels used for many highly specialized applications and Timken Rock Bits which have revolutionized modern mining and construction.

The Timken Company has spent millions in research and technological improvements so that millions of Americans may enjoy a better life—so that engineers like yourself can rely implicitly on each Timken product—each Timken recommendation.

Engineers have at their disposal all of the facilities of this organization which is the world's foremost manufacturer of anti-friction bearings.

This company offers unlimited opportunity to many young engineers. Maybe you might like to come with our organization. We will welcome applications from engineers who feel that they may fit into a company such as ours.

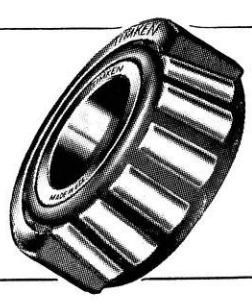
The old proverb—"Deviate an inch and you lose a thousand miles"—is a sound thought for young engineers to bear in mind. There is one thing as steadfast as the North Star—Timken Bearings are steadfast in dependable performance.

Everyone knows dependable performance is a basic requirement of mechanized America. Millions of wheels and shafts are turning faster, more accurately, more freely, and longer, because of the inherent qualities of this precision product.

It has been truly said that the trade-mark Timken incorporates all there is in Bearings. See that the trade-mark "TIMKEN" is on every bearing you use.

THE TIMKEN ROLLER BEARING COMPANY

CANTON 6, OHIO

TIMKEN  **BEARINGS**

THE FLAME THAT CUTS *through Sea and Steel*

Men-of-war that "died" at Pearl Harbor lived again to fight at Omaha beach and Leyte. No small measure of credit for their resurrection belongs to the modern techniques of underwater cutting with the oxy-hydrogen flame and underwater welding with the electric arc. These methods are serving the nation's needs in wartime, and are also opening the way to new peacetime accomplishments in submarine salvage and construction.

Air Reduction has played a leading part in designing and manufacturing equipment for underwater cutting, as part of its program of progress which has given the world many new developments in welding, cutting and other related methods for modern metal-working.

The operating subsidiaries of Air Reduction Company, Inc., are:

AIR REDUCTION SALES COMPANY
MAGNOLIA AIRCO GAS PRODUCTS CO.
Industrial Gases, Welding and Cutting Equipment

NATIONAL CARBIDE CORPORATION
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THE OHIO CHEMICAL & MFG. CO.
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AIRCO EXPORT CORPORATION
International Sales Representatives of these Companies

AIRCO

AIR REDUCTION

60 East 42nd Street, New York 17, N. Y.

. . . what else is in store for these Man-Made Gems?

THAT'S A GOOD QUESTION. But at this point no one can give you the complete answer to it.

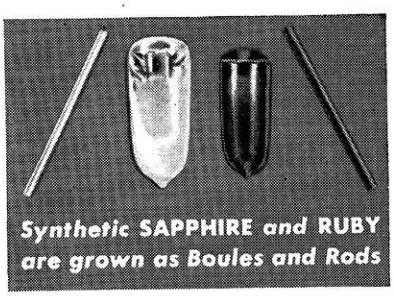
The full possibilities of these man-made gems have not been explored. The making of synthetic sapphire and ruby in this country is an infant industry—born in World War II.

Prior to the war, all our synthetic sapphire and ruby were imported. When our supply of these war-vital materials was cut off, THE LINDE AIR PRODUCTS COMPANY, a Unit of UCC, at the request of the government condensed into months the research necessary to master the techniques of quantity production.

Of all the gems, synthetic sapphire and ruby, like their natural forms, are second only to the diamond in hardness. Already they have many uses.

They are long-wearing thread guides in textile mills. They are the bearings in watches and delicate navigation instruments. They make phonograph needles that will far outlast metal. They are much in demand for jewelry . . . and are used for many types of cutting tools, gages, spray nozzles, burnishing wheels and insulators.

What else are they good for? If you are technically minded and read the italicized paragraph below, you may come up with a new answer or two.



LINDE SYNTHETIC GEM MATERIALS

In addition to extraordinary wear resistance and great beauty, LINDE synthetic sapphire and ruby are highly resistant to most chemicals and have high strength at temperatures up to 3,000 deg. F. and higher. Electrical losses at all frequencies are low. They can be given an exceptionally smooth surface, and can be bonded to other materials. Available in half-boules up to 150 carats, and in rods of 0.065 in. to 0.125 in. diameter.

For additional information send for the folder P-12 "Synthetic Sapphire Production."

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30 East 42nd Street UCC New York 17, N. Y.

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ALLOYS AND METALS—Electro Metallurgical Company, Haynes Stellite Company, Kemet Laboratories Company, Inc., United States Vanadium Corporation
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INDUSTRIAL GASES AND CARBIDE—The Linde Air Products Company, The Oxweld Railroad Service Company, The Prest-O-Lite Company, Inc.

Merry Christmas and a Happy New Year to all of you!

We hope this issue reaches you before the holidays and that you will enjoy reading it during that time, smoking the new pipe with that five-pound box of chocolates just within reach.

The January issue will mark the first issue of the new year and with it, we hope, will come a better magazine for your reading.

See you next year!

—The Staff

Hope he's good to you!

WISCONSIN ENGINEER

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In This Issue . . .

COVER:

BRUSH-WEAR PROBLEM SOLVED — *Impregnated brushes that preserve the essential film of oxide on commutators answered the brush-wear problem on airborne equipment at high altitudes. They have also solved similar problems on large machines such as this 900 kilowatt generator, similar to those which supply current for variable speed motors driving mill rolls . . . Courtesy Westinghouse.*

FRONTISPIECE:

ELECTRIC POWER MAKER — *Steam turbine-generator set, 160,000 kilowatts, in power station of Consolidated Edison Co., Brooklyn, N. Y. . . . Courtesy General Electric.*


ERAL ELECTRIC

The Basic Idea Underlying The Creation of TVA

—John Curley

THE Tennessee Valley Authority, the first of the "New Deal's economic brain children," is now twelve years old. Although the TVA had been discussed several times in the halls of Congress since 1916, nothing tangible resulted until Congress, under the urgings of the late Franklin Roosevelt, passed the Tennessee Valley Authority Act of 1933.

TVA is unusual in that it is in effect a federal corporation. Its stated purposes are: to control floods in the Tennessee Valley, to improve navigation in the Tennessee River, and to produce electric power.

The rich soil of the Tennessee basin had, in the years since the coming of the white man, become depleted of its fertility by erosion, and the reckless removal of its timber. It is the purpose of the TVA to conserve and rebuild what remains of the soil.

Too, the predominantly rural population of the region is backward industrially, socially and economically. It was hoped that the production of cheap electrical power by the Authority would encourage the establishment of industries in the region, thereby bringing a new prosperity to the poverty sticken people.

The advent of the steamboat in the 1820's, saw the Federal government taking a greater interest in the improvement of navigable rivers. This was the first phase of government interest in American streams. The interest in navigation was to develop into flood control and later on into development of the potential water power of the streams. The Tennessee River was to one of these streams.

Congress in 1828 appropriated money for the survey of a canal around the natural barrier at Muscle Shoals in the Tennessee River. Two canals completed in the next 60 years failed to accomplish the purpose for which they were built. In 1890 the interest to improve the navigability of the river passed to interest in developing its potential water power. After many differences of opinion as to whether the Federal government should participate in the costs of a private project at Muscle Shoals, President Wilson under the authority of the National Defense Act of 1916 ordered the construction of an experimental Haber process plant at Muscle Shoals. This order was later expanded to include a large hydro-electric plant. The ending of World War I in 1918 saw the project begun but uncompleted, and funds for its completion exhausted with no additional appropriations in view. The bid of Henry Ford at this time for properties stimulated interest in Congress to such an extent that Wilson Dam was completed at Muscle Shoals in 1925. The Federal administration again lapsed into a state of disagreement over the question of public or private operation of the plant. On the one side the executive branch of the government held for private operation while the legislative branch advocated public operation. With no concurrence in sight, the stalemate was extant on the eve of the national election of 1932.

The landslide victory of the Democratic Party in the national elections ushered in a new era of political thinking in the executive branch of the government. This new thinking, which was in direct contrast to that of previous administrations, contained many concepts for mildly socializing the American industry. The new viewpoint allowed the executive and legislative branches to come to an agreement on the question of the Muscle Shoals properties. On April 10, 1933, the political views of the new party were put into action by the speech of the late Franklin Roosevelt requesting the Congress to create the Tennessee Valley Authority. The president in his speech envisioned not only the development of the water power of the region, but the control of floods, soil erosion, and afforestation. The TVA was to be a long range plan for the betterment of the Tennessee basin, and the President showed it was to act as an experiment for similar developments in other parts of the nation when he said, "If we are successful here we can march, step by step, in a like development of other great territorial units within our borders." The Congress prepared now to act on the President's suggestion.

The day following Roosevelt's speech, Senator Norris introduced in the Senate a bill providing for the comprehensive program envisaged in the President's speech. The bill provided that the Act should be administered by three members appointed by the President with the approval of the Senate; and that the objectives of the proposed law should be flood control, national defense, promotion of agricultural and industrial development, improvement of navigation, and the development of hydro-electric power, reforestation, and proper use of marginal lands. The bill also gave the Authority the power to construct additional dams, reservoirs, and the power works in the Tennessee Valley, and the right to produce and sell

(please turn to page 20)

Water For San Diego

—Bob West, c'45

IN 1940, San Diego had an adequate water supply system. In normal times this system could be expanded to meet the expected rise in population, but the war caused a rapid increase, and a loss of technical help, which resulted in a system that is now heavily overloaded.

The water for this city is stored in five reservoirs with a total safe yield of 26.6 mgd., which is sufficient for a population of 250,000. This supply was ample for the 1940 population of 202,000. In 1942, the influx of people to operate the war factories and inhabit the numerous armed forces training camps caused the population to increase to about 350,000. The water supply system was severely overloaded, and little has been done to alleviate the situation.

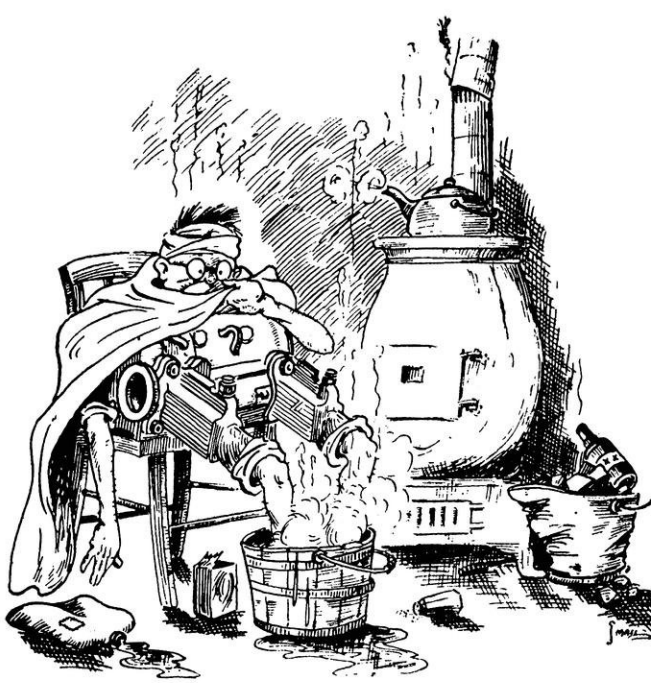
At the present time, the reservoirs operating are: Morena with a capacity of 67,211 acre-ft., built in 1910; Barrett, 42,796 acre-ft. capacity, built in 1923; Otay, built in 1917 with 56,314 acre-ft. capacity; Hodges, 37,533 acre-ft., built in 1918; and El Capitan, capacity 116,448 acre-ft., built in 1934. Since rainfall and melting snows are the source of San Diego's water, the safe yield depends upon how often there is a wet year to fill the reservoirs. The safe yield for the reservoirs is figured on a ten-year period of relatively dry years. The safe yields from these reservoirs are: Morena, 5 mgd.; Barrett, 4.8 mgd.; Otay, 3.8 mgd.; Hodges, 3 mgd.; and El Capitan, 10 mgd.; which totals up to 26.6 mgd. The city has drawn 46 mgd., and more according to reports in the "San Diego Union" (the daily morning paper). Monthly averages have run from 40 to 50 percent over those in 1941, which were above average.

What has been done to relieve this heavy over-drawing of the supply? Some relief was given by replacing an old 18-inch woodstave pipe. It was planned to install a booster pumping station at El Capitan, but it was not possible to secure the necessary priority for the equipment needed. The construction of the San Vincente Dam was rushed to completion.

A study of possible sources of water, made in 1936 revealed that San Diego could go to the "All American Canal" and pipe water over the mountains, a distance of 96 miles, or connect with the aqueduct of the Metropolitan Water District of Southern California, which serves the Los Angeles area, and bring water 78 miles over a less rugged route. It was decided to develop the supplies within the county first, to a possible 46.8 mgd., and the go to the "All American Canal". Little has been don since then to improve the supplies within the county. O more reservoir, San Vincente, has just been completed an will supply 5 mgd.

Since this excessive demand has arisen, the city officia have decided to go to the Metropolitan District. The have succeeded, with the help of Army and Navy off cials, in getting financial help from the United State government. With his help they have gone ahead wit the laying of a pipe line from the San Jacinto regulatin reservoir to the San Vincente reservoir. A contract ha been let for 23 miles of this aqueduct and the Navy d partment has assured help on the remainder of the line.

San Diego is still facing the problem, but solution is o the upgrade. No longer is a situation such as occurre after the 1897-1904 drought probable. San Diego wi have sufficient water.



Now that cold weather is here—

BITS IN THE NEWS

EXPLORERS HELPED WIN WAR

BEFORE the beginning of the war, explorers made several expeditions to New Guinea. The information gained by them helped the United Nations to defeat the Japanese in jungle warfare, Geoffrey M. Tate of New York City and a member of the Archbold expeditions, American Museum of Natural History has declared.

The men on the expeditions experimented with the food found there, knew the type of clothing necessary and suitable, made maps of the localities which were relatively unknown until the war turned them into household names, knew the country over which the armies would fight. They also knew to what extent the soldiers could live on the land, the type of vegetation found there, gave advise on the insect hazards which the troops would encounter.

•

SYRACUSE UNIVERSITY'S INTRA-TEL SYSTEM

Soon, in postwar delivery, Syracuse University will be getting an "Intra-Tel" system—wired television.

The television equipment will be used for classroom and teaching experiments as well as teaching television techniques and programming to the students.

It is possible, too that a plan might be worked out with local radio interests in a co-operative arrangement for broadcasting programs to the Syracuse area.

Students will have the opportunity here to study various television operations — lighting, camera operation, script writing, costume and stage set designing, stage and technical direction, sound and picture control and transmitter operations.

•

CHRISTMAS TREE LIGHTS—WHY THEY WERE SO HARD TO GET

Those tiny Christmas tree light bulbs were adapted to war and harnessed as vital units. These glass ampoules, filled with strong acid, were basic parts of an advanced fuse for shells used by the Navy in anti-aircraft operations.

Many Japanese aerial attacks were broken up in split second timing by the precision anti-aircraft fire, which reached new peaks of effectiveness through this new fuse.

The ampoules are shaped much like the thumb of a woman's hand, filled with acid and sealed. Every dimension is precise to the thousandth of an inch.

Since the ampoule had to be made with such precision, and being slightly different in shape from the Christmas tree lights, adjustments had to be made quickly after the need for it was recognized.

Manufactured at the rate of millions each month, as the reconversion circle becomes complete, the Christmas tree bulb will again be produced in the volume of prewar production.

•

POWERFUL ATOM SMASHER

The creation of matter from energy can be accomplished with radiation in a new atom smasher developed by General Electric. Called a betatron, this device operates at an energy of 100,000,000 volts.

•

ELECTRICALLY GUARDED FISH

An instrument, an electronic fish fence is keeping the fish in protected waters in the state fish hatcheries in Pymatuning Lake reservation, Pennsylvania. Thus millions of them are saved for later planting in the streams and lakes in the state.

This device was invented by Henry T. Burkey of the Electronic Fish Screen Company, Hollywood, California and consists of one or more rows of strips or metal rods, serving as electrodes through which electrical impulses are sent and set up an electric field in the water.

This impulse creates an electrical force, giving the fish a shock, harmless, but effective in sending them back to a safe area. The impulses are created rapidly from an electronic generator which results in a special wave form or current turning back small and large fish at the same time, this being impossible with ordinary current.

At Pymatuning, the fence prevents the fish from migrating to open water where they would be caught by fishermen or eaten by larger fish.

CAMPUS HI-LITES

—Milly Smith, m'46

Jane Strosina, c'46

POLYGON BOARD

The Polygon Board started the new semester with an almost complete turnover of members. Holdover from last semester is Gerald Keppert, E.E.4, who is the new president for the coming term. Other new officers are Treasurer Bill McCoy, C.E.4, and Secretary Jack Slater, C.E.3. The rest of the board is made up of John Thuerman, M.E. 4, Bob Axtell, Ch.E. 4, Warren Ferris, E.E.4, George Holloway, M.E.3, and Jack Roeber, Ch. E.4.

The furniture for the M.E. lobby, a project backed by the Polygon Board several years ago, will soon be returned to its rightful position. It has been in storage for the duration.

Plans are under way for a huge smoker to be sponsored by the Polygon Board in December. With all the returned students and "reconversion" of our campus, this is the big chance for engineers to get acquainted. A good program is being planned as well as smokes and refreshments. Let's have everybody in the College of Engineering turn out for the **All-Engineer Smoker.**

—Jack Slater

•

M.E.S.W.

November 14, 1945.

The Rock River Valley section of the American Society of Mechanical Engineers held a joint dinner meeting with the student branch of the A.S.M.E. and the Mechanical Engineering Society of Wisconsin in Tripp Commons at the Memorial Union.

After dinner Mr. E. J. Dahlund, chairman of the Rock River Valley section introduced the speaker for the evening, Mr. L. J. Markward, assistant director of Forest Products Laboratory. His subject was "Wood as an Engineering Material". Mr. Markward showed slides and spoke on the structure and growth of trees, the treatment of wood, laminated wood, plywood, and sandwich construction of wood in combination with other materials. He brought several samples of wood with him. Mr. Markward answered the questions of the group.

Mr. Dahlund closed the meeting.

•

REGISTRATION

The enrollment was swelled by returning veterans. Results of the November registration were 370 freshmen, 243 sophomores, 355 juniors, 148 seniors, and 20 graduates, giving a total enrollment of 1136 students. 411 of the students are Naval trainees stationed on the campus.

Professor Hyland, one of the most overworked professors during registration said, "There is too much emphasis of refresher courses for returning veterans. It only makes the men timid on entering courses from where they left off. Very few require refresher courses."

•

We've heard (several V-12's verify it) that Dennis J. Sakols tried unsuccessfully for one-half hour to climb to a "Welcome" sign in a second story window of Tripp Hall, girls' dormitory. Said Dennis dejected, "Maybe they don't really mean it."

•

When signing up for quiz section in the Econ class of over 200 students, a Johnson forgot to sign his first name.

Proud father Carl Malome was in too much of a daze to answer roll on the day after the happy event. It's a 7 pound girl born November 12, 1945.

•

Nan Deck B.A.2 is wearing something new on her third finger, left hand. It's a beautiful engagement ring given to her by Terrell "Swing" Singletary, junior M.E. . . . Dick Tarrice, M.E.3, Sigma Nu pinned Pat Sullivan. . . . Gil Stockwell, senior Ch. E. hung his A.X.E. pin on Ruth Ross.

•

Some of our M.E.'s made the front page of the newspaper. Among notables pictured in a Washington scene were President Truman and football players Larry Scott and Bob Marichal. After shaking the President's hand, the fellows refused to wash their hands. And why should they, at 25 cents per handshake.

•

Gene Mathews leads the engineers represented on the varsity basketball team. 5' 5" Gene was one of the stars of the 1944 basketball squad. Other engineers on the team are Maury Rhude, Art Rizzi, Bill Richmond, Jim Strutmen, Pete Zernoff, and Bob Matte.

•

The Mechanicals put it over on the other societies by setting up an M.E.S.W. desk at registration to get new members. It was a very successful venture.

Note: The co-editor of this article will take no responsibility for the above statement. Some freshmen thought it was just another blank that had to be filled out.

(please turn to page 24)

Through The Lens

—June Hartnell, e'46

LIKE so many modern arts, optical lenses and glasses have their discovery and evolution shrouded in legends and tales that have been told and retold, added to and changed throughout the ages. But no matter the true story, the evolution was a miraculous path trod upon by the most brilliant minds and determined hearts.

The modern lens as we know it, is much more than just a highly polished piece of glass, yet the art of glass making was the mother of the lens, and historical facts seem to bear out the fact that glass making began in Egypt or Phoenicia and from there spread to other countries.

Early Phoenician traders, so an old legend goes, stopped to make camp on a sand bank and not being able to find stones around which to start a fire used blocks of soda instead. The heat of the fire caused the soda to combine with the sand, thus forming glass. It seems, however, that such a legend is highly improbable—that glass could have been made in such a primitive way. But yet the discovery must have been an accident, it could not have been premeditated.

The ancient glass makers in their early glass creations displayed a definite creative ability and imagination. Some of their wares were the product of a master's hand. They lack, however, those qualities so necessary in the modern glass—transparency, freedom from color, and brilliancy. It was the Italian glassworkers who first produced color-free glass that was relatively transparent. They were from Murano, the glass center near Venice.

Just the glass being available for the modern lens did not initiate the final product. A need had to be realized, and basic ideas and properties of the lens had to be discovered. There seems to be some indication that crude lenses were used, but the plane metal mirrors were the only widely used application.

It was for Sir Isaac Newton and other scientists of his time to discover the laws of refraction and dispersion. Newton proved that white light is really a mixture of many colors. He set about trying to correct what is now known as chromatic aberration which others had tried to correct with more highly polished surfaces. Newton recognized the cause as being color dispersion, but he did not solve the problem because he failed to see that it could be corrected by the combination of two lenses. In fact he definitely believed that it could not and thus impaired development of the lens. It was not until the end of the eighteenth century that Euler and Klingenstjerna proved that chromatic aberration could be abolished by combining a converging and a diverging lens. In 1758 the first such lens was made.

All this work had now opened a new field. Highly polished and finely ground pieces of glass had served the opticians' desires and needs before. Now there was the demand for glasses that were more suitable for optical systems.

Only two kinds of glass were available at this time—the flint glass and the crown glass. The flint glass consisted of lead oxide, sand and potash and had a high refractive index and high dispersion powers. The crown glass consisted mainly of soda, sand, potash, and chalk. The refracting and dispersion powers of the crown glass are considerably lower.

The achromatization of lenses depends on two types of glass with different dispersion, therefore both types of glass were needed. While crown glass could be produced that was comparatively free from irregularities, flint glass presented the loophole. Thus the optical industry began concentrating its efforts on flint glass. Pierre Louis Guinand, a Swiss and Joseph von Fraunhofer, a German deserve the credit for the first successful flint glass. Guinand has sometimes been called the father of the optical glass industry. Although born in Switzerland, he moved to Germany and there he developed his methods of producing optical glass. Returning to Switzerland he set up his plant and from then on it became a family affair. After his death, his sons continued his work, one established a company in France. One of his descendants came to America, but where the others had succeeded, he failed.

Although the optical glass industry had taken many big steps and had come a long way, new theories and facts were being discovered and slowly arose a new demand for lenses of better design with characteristics entirely different from those obtainable from ordinary flint and crown glass. Ernst Abbe and Otto Schott after five years of research and experimentation were finally able to produce glass of such a quality as was needed.

But as in so many fields, the United States, at the opening of the first World War found herself dependent on the optical industry of Europe. With much of this cut off with the beginning of hostilities scientists here desperately

(please turn to page 19)

ELECTRICAL DRAINAGE OF FINE SOILS

—H. D. Miller

UNTIL recently the successful drainage of fine soils posed a challenge to engineers. Coarse grained soils, such as sand and gravel can be drained by ordinary methods, but fine grained soils have water-retaining power greater than the force of gravity and also a permeability too low for the successful use of these ordinary methods. Evaporation originally the only solution often failed because the soil was not accessible to the air or because climatic conditions were not suitable.

The electrical method is based on an effect known as electro-osmosis, wherein the passage of a direct current drives moisture from the positive to the negative electrode.

In laboratory investigations carried out by the British Road Research Laboratory, the soils to be tested were first dried and then ground to a powder, which, in turn, was mixed with a known amount of water until a mortar of uniform consistency was formed. A sample of this mortar was then poured into a cylindrical mould the ends of which were covered with aluminum foil. The surface of the cylinder was covered with shellac so as to minimize evaporation losses. The passage of electric current through the sample caused water to appear at the cathode but none was seen to leave the anode. It was noted that resistance heating, the familiar I^2R loss inherent in all electrical apparatus, occurred at the anode. For laboratory purposes this effect was eliminated by limiting the current to 70 milliamperes, and by coating the ends of the specimen with graphite. For practical use it is unnecessary to eliminate this heating because it is actually an aid in increasing moisture movement. The existence of a temperature gradient causes moisture movement to cooler parts of the soil, while the increased temperature increases the permeability of the soil and helps to promote evaporation.

By passing a current through several cylinders in series, the amount of water expelled from each cylinder was the same. Thus the amount of water moved depends on the quantity of electricity passed through the soil. Up to about 1000 coulombs, a linear relation existed between the amount of water expelled and the quantity of electricity passed.

The size and shape of the test specimen influenced the test only in that it varied the resistance between electrodes and consequently for the same current, the different cylinders consumed varying amounts of energy. The linear relations mentioned hold for nearly all soils. The weight of water expelled for a given potential difference between electrodes was least for heavy-clay soils and greatest for sandy soils. A nearly linear relation exists between the clay content and the amount of electricity to expel a given amount of water.

The only large-scale commercial applications of the electrical method have been undertaken in Germany. While excavating a cutting, forty yards wide and twenty-five feet deep, the soil was found to be so soft and wet that when the depth reached eight feet it was proposed to abandon the project. As a last resort the electrical drainage system was put into use. Twenty 4-inch well pipes were sunk to a depth of 25 feet. Pumping produced a negligible flow of water, but when the electrical circuit was closed the flow rose to 88 cubic feet per hour, and the experimental section of the cutting was completed several weeks before the remainder of the cutting. The subsoil had dried out sufficiently in only a few days for the excavators to work in the cutting at any angle of slope.

In another case a road embankment constructed of silty soil was very unstable due to excessive moisture content. The application of electrical drainage reduced the moisture content by about 35%. Some of the water, however, was trapped on the way to the drains by gravel patches.

The electrical method is best suited for jobs where rapid temporary drainage is necessary, such as in checking incipient landslips and in the treatment of excavations. It is best suited to silty soils. The cost is dependent on the cost of electrical energy, the quantity consumed varying from 3 to 40 kw. hr. per cu. yd. In all cases tests must first be made in the laboratory and it must be remembered that electrical drainage is only a temporary measure, to serve until permanent installations can be made.

Alumni Notes

—Joe Teskoski, m'46

Civils

DAMES, ERWIN, c'20, who has been ity manager for Pacific Grove, Calif., or many years, was recently appointed lanning Technician for the planning ommission of Santa Clara County, Calif.

LINDNER, LT. COL. C. P., c'25, has een appointed director of the U. S. Waerways Experiment Station at Vicksurg, Miss.

ZOLA, CAPT. STANLEY P., USNR, '27, is commanding officer of the Cener Public Works Department at Great akes.

BINISH, STANLEY E., c'29, who has een in private practice at Green Bay as ttorney and civil engineer, received the egree of Master of Laws from George Vashington University at Washington, .C., on May 30. During his student ays, he was a football star on the Wisonsin team.

LYNEIS, CLAUDE A., c'33, is reorted to be with the Du Pont Company t Wilmington, Del., in the engineering epartment.

WERNISCH, LT. GEORGE R., c'35, ec, USNR, is with the U. S. Naval echnical Mission in Europe. He writes: Have been getting quite an education n construction,—German style. Expect o be able to visit Madison by Christnas."

LINCOLN, FRED W., c'36, after sevral years with the Great Lakes D. & D. o., is now with the Milwaukee Road in he bridge and building department, ith headquarters in the Union Station t Chicago.

JENSEN, HOWARD R., c'37, was narried on June 29 to Doris Helen Bahler of East Bernard, Texas.

BACHMAN, CARL J., c'37, is with he Milwaukee Road, with headquarters n the Union Station at Chicago.

ROSECKY, JOHN E., c'38, who has been with TVA since October, 1941, is naterials engineer on earth fill for the onstruction of the Kentucky Dam at Gilbertsville, Ky.

SCOVILL, NORMAN D., c'38, superintendent of construction for Sill Construction Co., of Chicago, was drafted last August.

VAUGHN, LT. COL. JAMES S., c'38, USA, is head of the personnel division, Signal Section at Manila.

KRAHN, RICHARD G., c'39, who served as first lieutenant in the 202nd Field Artillery with the 3rd and 7th Armies in Europe from January, 1944, to May, 1945, began work on Nov. 5 with the Jerry Donohue Engineering Company of Sheboygan, Wis.

KLEMA, ROY L., c'39, has returned to the University of Idaho, where he is an instructor in civil engineering, after a year spent on harbor work at San Pedro, Calif.

DIETZ, LT. COL. JESSE C., c'40, after 43 months overseas, has returned to the university to continue his graduate work for the doctorate degree.

SERDAHELY, STEVEN G., c'43, who has been with United Aircraft at Glastonbury, Conn., has returned to Milwaukee where he will go into partnership with his father in the contracting business.

WILKE, LT. RICHARD W., c'43, is with the 1062 Engr. Forestry Co. at Manila. He writes: "We went into Germany behind the 1st Army and were near Cologne when the war ended. Our mission was to produce lumber. They put us on the first boat out of France and we landed in Manila last July. Our living conditions are not bad, but I prefer Germany to the Philippines."

BUNTROCK, LT. HARVEY A., USNR, c'43, announces the arrival of Linda Jo on October 22. He has been stationed at the Boston Navy Yard but may now be addressed at ARD #17, c/o FPO, San Francisco.

WILLIAMS, LT. GEORGE A., USA, c'43, was ordered to report to Ft. Jackson on October 15 to be shipped to Italy, where he expects to be engaged in the removal of land mines.

BECK, EARL J., c'44, has been released from service and is now back at Wisconsin as a graduate assistant, working toward his master's degree.

•

Chemicals

HEAD, GUERDON H., ch'21, has been promoted to superintendent of the Racine plant of Wisconsin Gas and Electric Company.

WHEELER, RALPH G., ch'25, passed away September 14 at St. Mary's Hospital in Milwaukee after two years of illness. Since 1943, the late Mr. Wheeler had been superintendent of the Wisconsin Gas and Electric Company.

ELLIS, PIERCE G., ch'31, is Budget Director of the Wisconsin Public Service Corporation and was elected as a director of ESM. Mr. Ellis and his Civic Affairs Committee recently prepared an extensive study of natural gas for Milwaukee.

NIENOW, FLOYD, ch'34, stopped here for a visit on September 20. He is with the Pennsylvania Salt Company in the technical service department with headquarters in Philadelphia.

GAPEN, CLARK, ch'35, is the assistant superintendent of Dry Starch Division, Corn Products Refining Company at the Argo, Illinois plant, working under **A. J. BULFER,** ch'22.

GRANGE, R. A., ch'35, has made several talks before local ASM (American Society for Metals) chapters. A paper of his "Factors Affecting the Hardenability of Boron-Treated Steels" has recently been published by ASM.

ANTLFINGER, GEORGE J., ch'41, is working with the B. F. Goodrich Company as shift foreman and supervisor of non-technical men in the operation of various departments. Prior to this, he was with the National Aniline and Chemical Company as replacement engineer in charge of the replacement of outdated or worn out equipment of all types.

MILLONIG, LT. LAWRENCE, ch'42, was recently home on a 30-day leave. After graduating from the University, Lt. Millonig worked for the U. S. Rubber Company in Detroit working on synthetic processing for tires. In 1942 (November) he entered the engineering cadet training at Yale. At Kelly Field, he had eight months more training on airplane maintenance and in 1944 left for Italy where he served for fifteen months.

VETTER, LT. J.G. EDWARD R., ch'42, received his Commission December, 1942. On February 13, 1943, he was married to Miss Elizabeth Ann Hotchkins. He was promoted to Lt. jg in March, 1944 and was stationed at the Naval Combat Demolition Training and Experimental Base in the South Pacific. Lately he was reassigned to a Florida camp.

(please turn to page 24)

Short Circuits

—Dick Papke, m'48

Ken Burmeister, ch'47

First rule of etiquette for college men: Always tip your hat before striking a lady.

•

ChE—"Can you dig me up a date for tomorrow night?"
M.E.—"Sure, but wouldn't you rather have a live one?"

•

Ten people under an umbrella and nobody got wet.—It wasn't raining!

•

Host: "I'd offer you a drink, but I can't find the water key."

•

When can a rabbit sit on a stump?
When the tree is cut down.

•

First: "Look. I've got a two dollar bill."
Sec.: "You're lucky. I just got a three dollar bill from my dentist."

•

"What'll it be?"
"A beer," he says as the quarter lands on the bar.
"Say, that two-bits sounds like it's made of lead."
"What do you expect for two-bits? Chimes?"

•

Pessimist: One who looks both ways before crossing a one-way street.

•

I asked for the guilded cage, but got the 'bird' instead.

•

When meat rationing first began, a farmer reported to his board that he had several hundred pounds of beef in storage. To a letter demanding why he had so much on hand he replied: "It was necessary to kill the whole steer at one time."—Coronet.

•

Metallurgist I: "What is the opposite of 'rude'?"
Second ditto: "Pearlite."

•

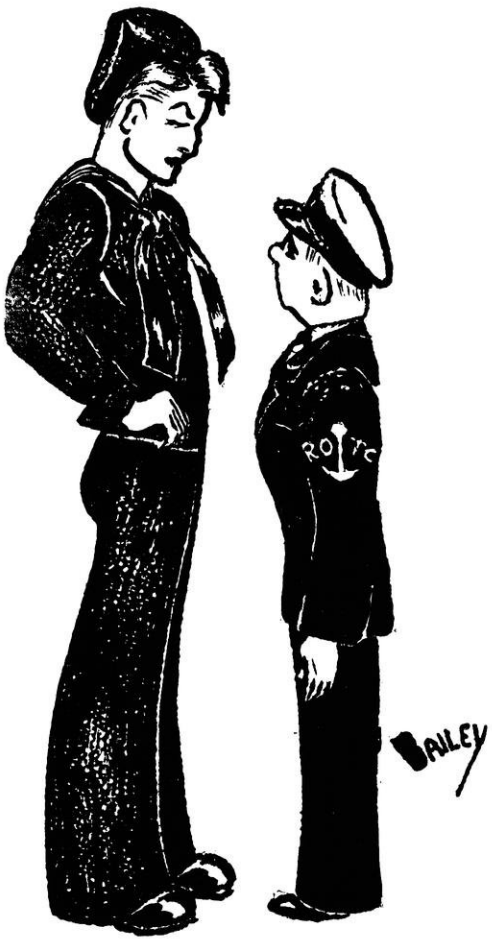
Engineer to roommate: Gad! Here it is—only three in the morning, and I'm getting tired already!

•

Prof.: What is Lincoln's Gettysburg Address?
Law student: I didn't know he moved!

•

If you think these are bad, wait till you see the ones left over for next month!



How many semesters have YOU been in the Navy?

Pilot of first bomber: "Did you see me buzz that water tower at the end of that orchard?"

Belly gunner of second bomber: "We got a good pilot too. Care for an apple?"

•

There we were. Seven of us in a boat and the oars leaked!

•

If all the statisticians were placed end to end, it would be a good thing.

•

Groom to best man: "Have you kissed the bride?"
Best man: "Sure, lots of times."

Making a **MIDGET**

. . . to do a man-size job!

NO bigger than a five-grain aspirin tablet —that's the size of a new non-linear coil, specially designed so that an FM transmitter and receiver might fit into the cramped interior of a tank!

This mighty midget that does the work of *four vacuum tubes* and *two tuned circuits* was developed by Bell Telephone Laboratories—and constituted a real challenge to the manufacturing engineers of Western Electric. Besides being the smallest toroidal coil ever produced for electronic equipment, the materials used were of the most delicate.

The core of the tiny doughnut-shaped coil consists of a small ceramic form wound with permalloy tape 3/32nds of an inch wide and in thickness about 1/20th the diameter of a human hair. The problem was how to wind 1/50th of a gram of this fragile tape around each core, and then to wind fine wire around the taped form.

Western Electric engineers discovered that a standard coil winding machine could be adapted for wrapping the foil-like tape around the form. However, when it came to applying the required forty turns of wire, they found that the only effective method was to have the wire *sewn by hand* around the minute core through the hole in the center . . . in much the same way that a seamstress sews around a buttonhole!

This system efficiently met military production demands—to the tune of over 100,000 units. It was just one of many far-reaching, interesting assignments mastered by radio, electrical, mechanical and industrial engineers at Western Electric. Now these combined production skills are once more dedicated to Western Electric's 63 year old job as supply unit of the Bell Telephone System.

Buy Victory Bonds—and keep them!

Western Electric

SOURCE OF SUPPLY FOR THE BELL TELEPHONE SYSTEM

A BIT AT THE "U"

A MAP AND YOU

AN EDITORIAL

TO a small boy of ten a map puzzle may be hard to put together. Johnny tried and succeeded because he turned it over and first fitted together the pieces of a picture of a man.

And thus with life. Your life is your map. You are the man that has to be fitted together before the map will fall into place. Everything you do is a piece to the final picture. One center piece around which others will or will not fit depending on your choice is your EDUCATION. And have you put this piece in its proper place?

You're here studying engineering. You have picked up that all-important piece. You returning vets have shown you recognize it as such. But it has not yet been placed so others will fit into it. That can be done to some extent here in college—the rest will fill in after graduation.

Your life in school—socially, morally, physically, and educationally all provide pieces that will fit into your piece of education. Which one you choose is up to you. What is your man and map going to look like?

Each piece you try may not fit. You must be able to see if it will be a nucleus for others. Some will have to be tried. If they don't fit, have the courage and will power to recognize it as such and discard them quickly and completely.

To some of you education may be a piece not seriously handled before. It is new, different, but it is not expendable. You may not have decided to call a center piece engineering. Perhaps it will be law, medicine, or agriculture. But you must be able to recognize the piece when you find it. Don't spend twenty or thirty years looking for a piece you can't find. Look around and then select the piece you want.

Others of us will soon be ready to fit in pieces called experience, a job, independence. During this building you may be tempted to replace some pieces already there with others that would seem to make map building easier. What may appear to be a shortcut is just a detour beyond the first turn. Keep building on the solid pieces already placed and keep them there.

The size of your map is up to you. Don't make it crowded or centered around just one piece. As an old proverb goes—Don't put all your eggs in one basket. Grinding away on books all the time is one basket. Put 70% of them there and study hard and with intelligence. The other 30% put into baskets marked, activities, sports, social affairs and working with others. These baskets hooked together will make another piece and lead to other pieces that will fit into your piece called education. How large is your map going to be?

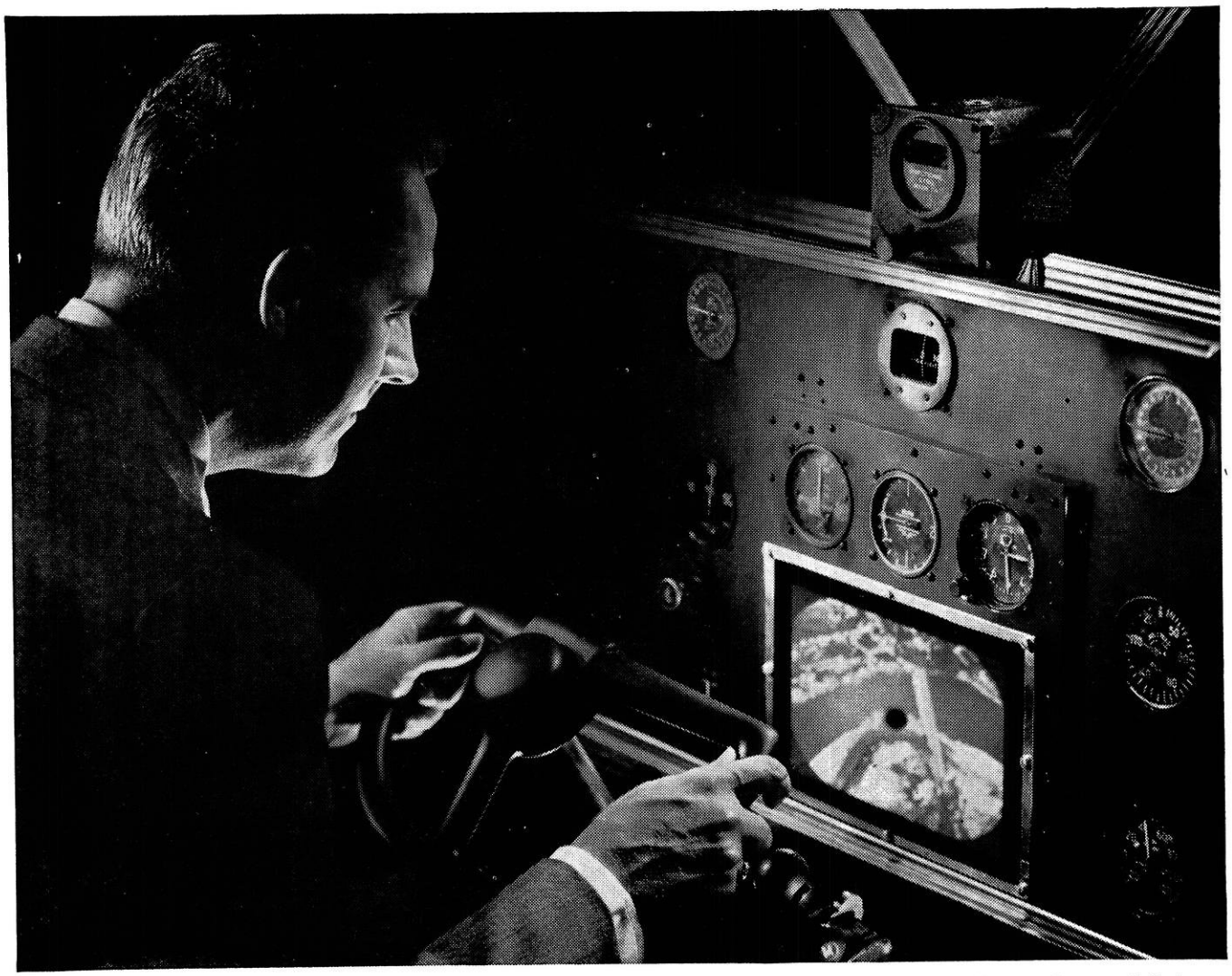
How is your map going to look to other people? Are they going to shun it because it is dark and bleak or are they going to enjoy looking at it and want to work with you and you with them? Your map is up to you. Put the man together on the other side first. Then your map will be what you have built.

—J. H.

GAS TURBINE RESEARCH PROJECT

The Department of Mechanical Engineering has received a gas turbine from the Allis-Chalmers Manufacturing Company of Milwaukee, consigned to the University for research purposes. The machine is a modified supercharger, facetiously called a "boot-strap unit" because of the fact that it operated itself. In normal usage, the supercharger is driven by the exhaust gases discharged from an airplane engine. The bootstrap unit, however, provides itself with hot gases, since the outlet of the compressor is connected through a combustion chamber, heating the combustion gases to a temperature closely approaching 1500° F. These hot gases are substantially like the exhaust from an airplane engine. The turbine blades run red hot. The machine operates at speeds ranging up to 25,000 RPM. Arrangements are now being made to install the unit in the mechanical engineering laboratory. The research work will be conducted by Myers and Uyehara, with the aid of graduate students. One of the problems to be investigated is measurement of turbine-blade temperatures. This and other research projects now in operation in the department will provide facilities for a number of graduate students to conduct thesis studies as part of the work required for M.S. and Ph.D. degrees.

This information was received from Dr. K. M. Watson of the Chemical Engineering Department and Professor L. A. Wilson of the Mechanical Engineering Department.



One of the many ways radar can serve aviation is by enabling the pilot to "see" through fog and darkness.

Radar – a "Moving Roadmap" for Flying

Pilots can now have an accurate radar "road map" of the earth below—showing landmarks and major details of terrain. Radar will make it a whole lot safer to fly at night or in stormy weather—as well as in broad daylight.

This is only one of the many possible uses for radar. For example, radar will "see" icebergs or islands many miles away—day or night—and enable ships to avoid them. It will provide man with an amazing new "sixth sense"—and will be used in a great many ways yet to be discovered.

RCA research and engineering played a leading role in developing radar. Similar research goes into *all* RCA products.

And when you buy an RCA Victor radio or television set or Victrola, made exclusively by RCA Victor, you enjoy a unique pride of ownership. For you know, if it's an RCA it is one of the finest instruments of its kind that science has achieved.

Radio Corporation of America, Radio City, New York 20. *Listen to The RCA Show, Sundays, at 4:30 P.M., Eastern Time, over the NBC Network.*

HOW RADAR WAS BORN

During RCA experiments at Sandy Hook in the early 1930's, a radio beam was shot out to sea. Men listening with earphones discovered that this beam produced a tone upon hitting a ship that was coming into the New York harbor.

Later on the question arose, "If radar could 'hear' couldn't it be made to 'see'?" So the viewing screen—or scope—was incorporated into radar. This scope is an outgrowth of the all-electronic television system that was invented and perfected at RCA Laboratories.

RADIO CORPORATION of AMERICA

From Old December Issues—

FIRED BEFORE HIRED Have you ever stopped to think what you are going to do about getting a job after you have completed your engineering course? Do you think that some organization is going to seek you out and offer you a job just because you have a diploma from the University of Wisconsin? Did it occur to you that you will have to do a good job of selling yourself to them or they won't even give you a second thought?

Recently, Mr. Clarence Francis, president of the General Foods company, made the statement that the average graduate has such a weak and feeble argument why the concern should give him a job that they could not be expected to have the least interest in him. He went on further: " 'Why do you want a job with us?' we ask. Invariably an empty reply is given. His only real inspiration on the matter had been that people always have to eat, and a good job with a food company ought to be a stable one, and 'my professor said that General Foods was a good company'. A reply of this kind is the most dependable of all methods of losing a prospective job." The average concern taking on college men wants someone who can show that he has considered himself fitted to be an advantage to his employer.

Mr. Francis said the reply should have been, "I have come to you because I have studied your company and others and have come to the conclusion that I am best suited for yours. I should much prefer a position in this definite branch of the work to any other. My previous experience in this work makes me best suited for it. I am willing to work for any salary you name while I am going through the stages of learning the ropes; have you a place for me?"

With an argument like that, the prospective employee is not starting with two strikes already called.

•

"Whatever your past has been, you have a spotless future."

•

Dentist: "Will you take gas?"

Patient (absentmindedly): "Yeah, and you'd better look at the oil too."

•

Editor's Confession: Half of these jokes I've seen before and the other half I don't see yet.—The Editors.

NIGHT BEFORE CHRISTMAS

December '44

—Revised

'Twas the night before Christmas
And through the whole plant
All workers were stirring
The machines sang a chant.
Each little plane-part was inspected with care
To make a bomber like the one in the air.
The shysters were nestled all snug in their beds
While visions of rich clients danced in their heads.
But me's with sliderules and girls in their jeans
All knew what hard work really means.
Soon out on the runway there arose such a sputter
An me spring from his lathe, a gal from her cutter
Away to the window they flew like a flash
Both half expecting to hear a great crash.
The moon on the breast of the new fallen snow
Gave a lustre like midday to objects below.
When what to their wondering eyes should appear
The bomber had landed, its image was clear.
Surely the chubby old pilot so nimble and quick
Who stepped from the cockpit wasn't St. Nick!
The motor grew weaker, then stopped with a sigh
He, with a deep chuckle and a twinkling eye
Took in the surroundings, the bright burning lights.
He whistled and marveled at all the picturesque sights.
He strode to the hangar and greeted them all
His booming voice echoed from wall to wall,
"I've filled your children's stockings with greatest care
But to miss you now would hardly be fair."
Here once again was old Saint Nick
And he hadn't changed the least little bit.
Still dressed in fur from head to foot
And covered oe'r with ashes and soot
A bundle he still had upon his back
He looked like a peddler with his great pack.
His eyes how they twinkled! His dimples how merry!
His checks were like roses, his nose like a cherry!
His droll little mouth was drawn up like a bow,
And the beard on his chin still white as the snow.
"You didn't think I'd be stopping in tonight
But to forget you would be a terrible plight."
His eyes twinkled and his little round belly
Shook as he laughed like a bowl full of jelly.
"And to each of you I leave this war bond,
Of all of you, I'm terribly fond."
And laying his finger aside of his nose
And giving a nod, into the cockpit, he goes.
But they heard him 'ere he flew out of sight,
"Merry Christmas to all and to all a goodnight!"

—Anonymous

THROUGH THE LENS . . .

(continued from page 11)

tried to catch up. The urgent need, however, drove research at a higher pace and by the end of 1917, we were keeping pace with the European industry.

Some German generals believed this war would be won by the country with the most highly developed photo-reconnaissance, and hence Germany with its highly developed optical industries which controlled most of the world's markets. The result is an old story. Our optical industries went to war. Their cities were destroyed, their camouflaged positions located and blasted because of the American lens.

Any two pieces of glass will not do this. The glass of desirable characteristics must first be produced, then they must be ground and polished within a millionth of an inch, they must be assembled with the utmost care and precision, they must be tested by the most critical methods.

It was the American engineer, physicist, chemist, designer, optical worker who met these requirements and gave us today a lens now home from the wars to be used in more research, and the fight against disease, in photography, now of the American scene—mountains, beautiful girls, the home.

Each mirror of ours today will reflect the heartaches, struggles, and eventual success of the early scientists that gave us the modern lens. Today American ingenuity meets new problems and gives us new and better lenses.

Old December Issues

December '36

PROF. KESSLER SPEAKS IN CHICAGO

At the annual meeting of the American Society of Agricultural Engineers held November 31 to December 4 at the Hotel Stevens in Chicago, Prof. L. H. Kessler of the hydraulics department presented a lecture on "Results of Experiments on Flow of Water Through Drop Inlet Culverts and Other Soil Erosion Control Structures." His subject was based on experiments carried on in the hydraulics lab, but also included recent research on the subject as well. The paper was of interest not only to those interested in soil erosion work, but to other fields into which soil erosion is entering, such as highway engineering.

Prof. E. R. Jones of the agricultural engineering department also presented a topic headed "Use of Drop Inlet, Soil Saving Dams in Wisconsin Soil Conservation Program."

December '30

OUR FEMININE CONTEMPORARIES

Not so long ago the idea of a co-educational system at the university was frowned upon—just why is hard to tell. That this prejudice was a hangover from the Victorian period is about as good an explanation as any. The same thing which prompted the Victorian women to cover the legs of their grand pianos with tiny skirts most likely was behind all the opposition to co-education for women.

A somewhat similar attitude is sometimes expressed by engineering students toward women who choose engineering as their course. The reasons given are different, but they are generally just as foolish. Some students seem to have the idea that engineering is an extremely hard-boiled sort of a profession and that women are out of place in it, and that merely because they are women, they can never achieve success in this field. Perhaps girls are a bit out of place in the machine shop or foundry—perhaps they cannot carry a transit as far through brush and rocks — perhaps they are not capable of bolting a ten-thousand ampere bus bar in place—but is all this really engineering? There is some romance in roughing it in South American railway construction camps, but for the majority of graduates this never materializes outside of popular novels. Engineering is, after all, mostly mental work, and very little of the strong-arm stuff. The men are rapidly getting away from the idea of boots and breeches as a usual campus costume at the various schools, and are dressing as well as our friends the lawyers, except when in the field when a rough outfit is necessary.

If a girl has an inclination toward engineering and has also the adequate mental equipment there is no reason why she should not study it.

TVA . . .

(continued from page 7)

surplus electrical energy. The passing of the bill with some slight modifications in regard to the Authority's fertilizer program was but the signal for future legislative turmoil with the private power interests of the region.

It was to be expected that the private power interests did not relish a competitor who could sell electrical power more cheaply. Private power objected to TVA being allowed to transmit the power it produced, and in 1935 Congress passed legislation clarifying this phase of the TVA program. Further friction was eliminated by TVA purchasing the property of the private power interest. TVA now controlled the power producing plants of the region, and would sell electrical power to the privately owned companies who would now act as distributors of TVA produced power. By 1941, the agitation created by TVA seemed to have subsided. Although the Authority's policies may appear to deal mainly with its power program, it has had other objectives in its comprehensive plan for the Tennessee Valley.

The underlying objective of the program has been to provide means for improving the economic opportunities in the Valley. The first of these means has been the improvement of the soil by replacing in the soil those elements that are essential for the production of crops: nitrogen, phosphorus, and potassium. The preservation of th top soil from erosion has contributed largely to soil im provement. The second of the means to improve th people's economic life has been the raising of the averag income of the people of this region. The arithmetic aver age of the South's annual income is about $300 less tha the nation as a whole. The reason for this deficiency i income is the unabundant supply of capital. The popula tion being mainly agricultural has accounted for th scarcity of capital. The objective of TVA has been th acquirement of methods to alleviate these two problems soil dissipation and low annual income.

The production of fertilizer by the Authority has bee used to restore the natural elements to the soil. TVA ha taught farmers to conserve their soil by properly apply ing fertilizers and planting soil conserving crops. TVA research has brought technological improvements to th region allowing perishable crops to be preserved in orde to be sold in off-season markets. Such improvement have been the community refrigerator which preserve the farmer's meat for future use, the furrow-feeder, an the improvement of the quick-freeze process for savin the strawberry crop. The machinery for these improve ments has not been manufactured by TVA. On the con trary, TVA has sought private interests for their manufac ture. The industry that TVA has indirectly brought int the region has provided the capital that will eventuall put the people of the Tennessee Valley on a new economi footing. The building of twelve dams on the Tennesse River and its tributaries has provided the flood protectio that has helped prevent the loss of property borderin on the river.

The apparent success of TVA's program shows th feasibility of an all embracing plan for the developmen of other river valleys. It has been thought that it i better to have separate agencies for each phase of th Authority's work, but TVA's progress has shown tha a single agency can best deal with the over-all plannin for the Valley. The conflicts that arise between divers programs can be more harmoniously settled by a singl organization under a single management. TVA has no as yet completely accomplished its objectives, but it i well on the road of doing so. It is a great experimen in Federal planning.

Why is it a man chases a woman until she hooks him

•

Will Power: The ability to eat one salted peanut.—Ano

•

A rut is a grave with the ends knocked out.

•

"For years", she said, "I didn't know where my hus band spent his evenings. One night I came home earl and there he was."—The Communique

OLD DECEMBER ISSUES

December '42

MIDWESTERN CONFERENCE

On Friday, November 13, five members of the local A.S.C.E. chapter braved the cold at the phenomenally early hour of 3:00 a.m. to go down to Urbana, Illinois. The occasion was the Second Annual Midwestern Conference of Student chapters of the American Society of Civil Engineers. The adventuresome five were Richard Andrae, Ralph Gribble, Ed Korpady, Charles Naeser, and Elroy Spitzer. They arrived at the University of Illinois after several hours of 35 m.p.h. driving in Ralph's 1928 Buick.

After registering at the Engineering Building, the fellows enjoyed lunch at the recently-constructed, colonial-style Union building. There was a general session in the afternoon, at which M. L. Enger, dean of the College of Engineering, gave the welcoming address, and Associate Dean H. H. Jordan spoke on "What This Conference Should Accomplish." That evening, a banquet was served at University Place Christian Church. Slides on the subject, "In the West Indies," were shown after the meal.

The boys overslept Saturday morning, but still managed to hear two speakers discuss the subject of sanitary engineering. After luncheon, there were two lectures, one on highways, and the other on airports. Following the meeting, the visitors were taken on a tour of the campus. There is a large artificial ice skating rink on the campus, but the highlight of the trip proved to be the visit to the Talbot Laboratory, and watching the three million pound testing machine break a concrete test cylinder approximately two feet in diameter and three feet long. The University of Illinois has some of the best equipment in Civil Engineering to be found in the country. They stress structural engineering to a very great extent.

The boys attended a dance in the Union Saturday night. After bringing their dates in at 1:00 a.m., they piled into Ralph's car and drove in shifts until they reached Madison at 9:00 a.m.

The schools represented were: Illinois Institute of Technology, University of Illinois, Iowa State College, Rose Polytechnic Institute, University of Wisconsin, Purdue University, and Northwestern University. The University of Iowa, also represented, was voted into the conference. Of interest to Wisconsin men is the fact that Elroy Spitzer was elected vice president of the next conference. This conference will be held at Iowa State. They are an enthusiastic group, and promise that they will have the best conference yet.

The boys also report that Iowa State brought along its first girl civil engineer since the 1880's . . . That the Illinois campus is very flat . . . there is no beer served in the Illinois Union building . . . Ralph's Buick was in excellent condition . . . the Illinois chapter has a good-looking blonde for its secretary . . . and that the conference is, as always, an interesting and enjoyable experience.

•

December '36

ELECTRICALS AND MECHANICALS VISIT CHICAGO

On October 19 to 22 about 86 senior electricals and mechanicals spent an interesting four days inspecting the various manufacturing plants in and around Chicago. Chartering two Greyhound buses, the group stopped at Beloit on their way to Chicago to visit the Fairbanks-Morse plant. The same afternoon the mechanicals inspected the Elgin Watch factory at Elgin, Illinois, while the electricals were in Chicago going through the Chicago Lighting Institute. Other plants visited by the mechanicals led by Profs. Pat Hyland and G. C. Wilson were the Carnegie-Illinois Steel Company, the Crane Company, Western Electric, Mars Incorporated, and the Crawford Avenue Generating Station.

Professors Watson and Koehler were in charge of the electricals and took them on a tour which include the G. E. X-Ray Corporation, Illinois Steel Company, and Wester Electric. One of the most interes ing places, however, was the Electro Motive Corporation, a subsidiary o General Motors, where stream-line trains are manufactured.

•

December '30

NEW STEPS

Those who noticed the worn down condition of the steps to th engineering building will be please to hear that they have been re surfaced, and thus the work don by engineer feet in scuffing off thre inches of stone in as many decade is all for naught.

Some of the math sharks shoul enjoy calculating how much sho leather is used up per annum in ac complishing all this destruction o public property. It certainly take more leather than stone—but eve that may be open to argument.

December '31

NEW TEST FOR STRUCTURE

A novel method of testing stee structures is described by the fo lowing news item, taken from th Daily Cardinal:

Tests Show That Bleachers Sway .005 Inches in the Wind

The new permanent bleachers a Camp Randall sway only .005 inche tests at the stadium Wednesda showed. The physical education de partment took several gym classe to the field to test the stands, be cause of report that at recent foo ball games the sway amounted t two or three inches, and gave spec tators some uneasy moments.

Narrow Measure on Quotation

It might be suggested that th mechanics department provide for phy-ed test of beams in their ne laboratory in the engineering build ing. Three gym classes of phy-ed is a rigorous test for anything.

ALUMNI NOTES . . .

(continued from page 13)

DIEDRICH, MEARL, ch'43, was killed in a plane crash in this country.

LAVRICH, MILTON, ch'43, visited in Madison this summer. He was married in June to Anita Bennett of Lawrenceburg, Indiana. At present he is working at the Schenley Laboratories in Lawrenceburg on penicillin production. Prior to this work he was with Lockheed Aviation in California.

VOLLMER, ART, ch'44, has been working on the atomic bomb project. He is with the Hondaille-Hershey Company in Decatur, Illinois.

WOERPEL, ENS. MARVIN, ch'44, visited Madison June 13th, 1945. He took part in the Luzon and Okinawa Campaigns as deck officer on an attack transport ship.

Electricals

POTTS, J. ARLINGTON, e'33, general engineer of the Wisconsin Power Company, has been elected president of the Engineers' Society of Milwaukee (ESM). The organization consists of 1,380 engineers. Mr. Potts has been chairman of the Milwaukee Section of the American Institute of Electrical Engineers.

Louis D. T. Berg

BERG, LOUIS D. T., e'37, for the past five years a sales engineer in General Electric's electrical welding division, has been appointed welding specialist of the company's Atlantic District. Mr. Berg is a member of AIEE and the American Welding Society.

BANDLOW, FRED, e4'0, has left the Cutler-Hammer Corporation to start an electrical contracting business in Theresa, Wisconsin.

SCHMITZ, NORBERT, e'42, is employed by the Cutler-Hammer, Inc., of Milwaukee as an experimental and development engineer on A-C dynamic lowering hoist controls. He is teaching an evening class in electrical engineering at the Milwaukee Vocational School. During the last season he won the Milwaukee Yacht Club season championship.

CREMER, JOHN W., e'44, was recently released from active duty as an ensign, USNR. While on duty, John was assigned to the Naval Ordnance Laboratory in Washington, D.C., as a design and development engineer of mine mechanisms, both electrical and mechanical.

LUECKER, GEORGE E., e'44, was inducted into the armed forces on October 22. Before induction, he was employed by the R.C.A. Victor Division as an engineer in F.M.—transmitters, design, and development.

Mechanicals

GREVE, F. W., m'08, me'09, who is professor of Hydraulic Engineering at Purdue University is the author of a recent bulletin of the Purdue Engineering Experimental Station. The title of the publication, No. 95 of the Research Series, is "Flow of Liquids Through Vertical Circular Orificies and Triangular Weirs." The experiments reported dealt with the effect of both kinematic viscosity and surface tension upon the coefficients of discharge. It was issued in May 1945.

CAMPUS HI-LITES . . .

(continued from page 10)

You've been ready for your Christmas vacation for months. So go to it, don't overeat, be careful of what you drink,—but whatever you do, have fun.

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Could we print the stuff, if we could print the stuff.

ECMA CONVENTION

On October 26th and 27th, John Thuermann and I attended the ECMA (Engineering College Magazines Association) convention at Columbus, Ohio on the Ohio State campus. Hats off and thanks once again to Mr. John Ramsey, retiring chairman, Mr. John Henry of Illinois, vice-chairman, Ernie Grabil and his Ohio State Engineer staff and everyone making the convention possible and a success!

Mr. Wayne Beattie of Colorado was elected new chairman and Mr Henry re-elected vice-chairman And next year it looks as though the convention will be at the University of Minnesota. —J. H.

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There was an informal meeting on Friday night after which many of us got better acquainted. Saturday morning the day's session began out on the campus. Mr. Littell of Littell-Murray-Barnhill was there to discuss the advertising with us. The educational program and discussion was handled by different schools and nearly all the points of a successful magazine were brought into the discussions.

Following the days work, a banquet was held at the Southern Hotel and even after Thanksgiving I can say—we ate! After that many had to catch trains but some of us had a chance to discuss the relative merits of schools. Although Wisconsin may not have had their select rifle representative there, their hockey teams took MIT.

The convention was a big success, we hated to see it come to an end!