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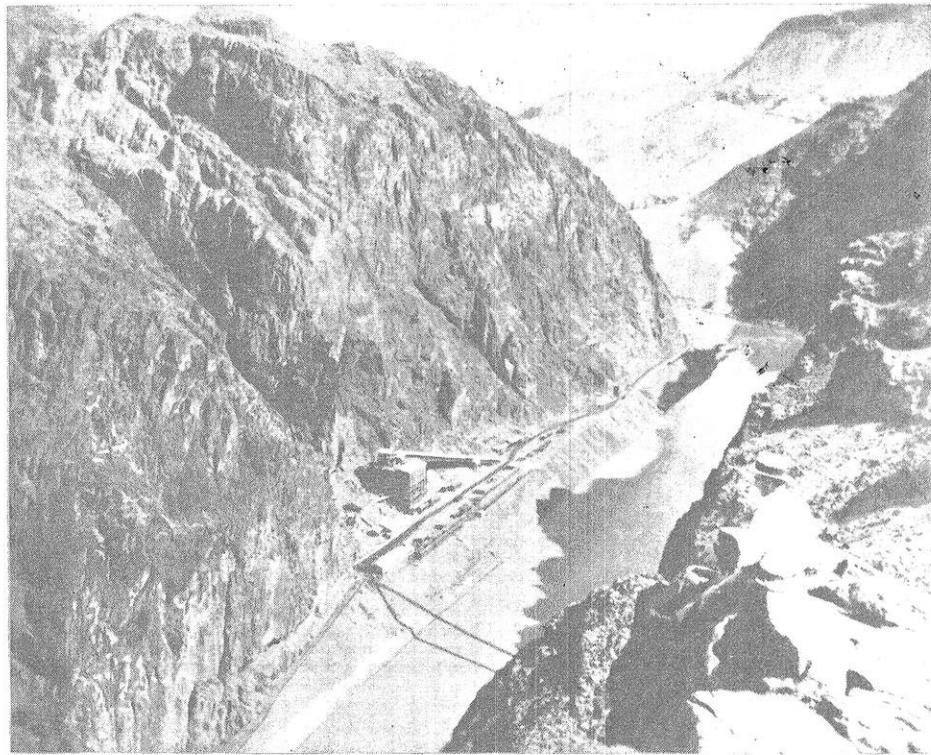
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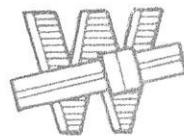
THE

WISCONSIN ENGINEER



*Engineering Society of Wisconsin
Convention Issue*

MARCH



1934

MEMBER, ENGINEERING COLLEGE MAGAZINES, ASSOCIATED

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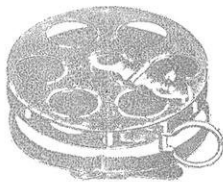
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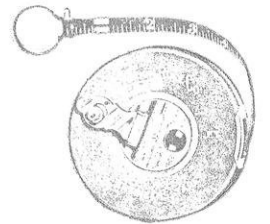
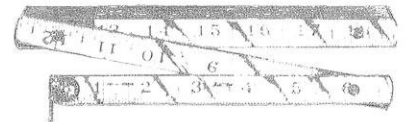


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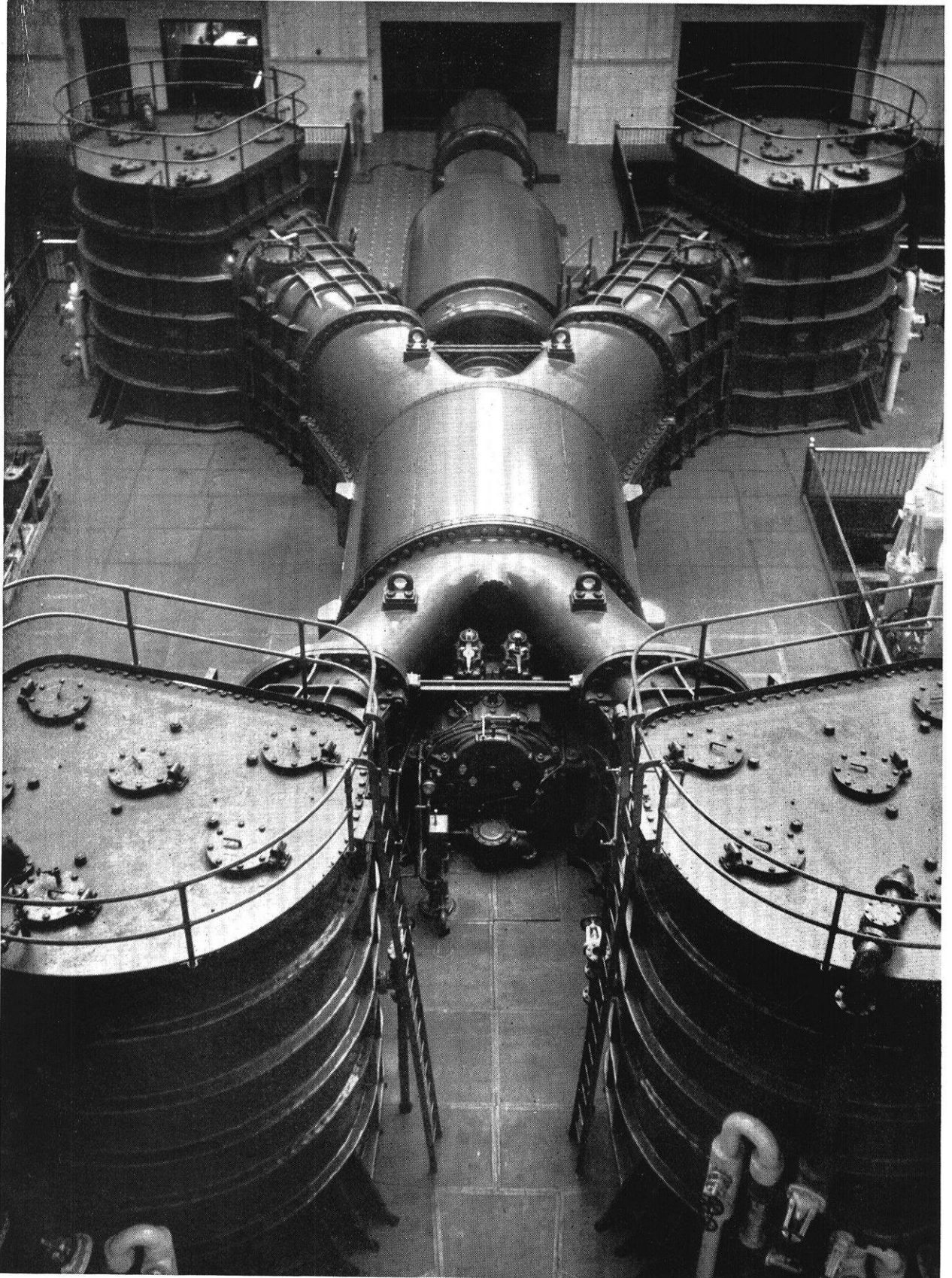
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—Courtesy Mechanical Engineering.

*Low Pressure Unit of the 208,000 K. W. Generator at State Line
Generating Company Station.*

The WISCONSIN ENGINEER

VOLUME 38, NO. 6

MARCH, 1934



Timber Engineering Research

By GEO. W. TRAYER, c'12, C. E.'22
Senior Engineer, Forest Products Laboratory¹, Forest Service
U. S. Department of Agriculture

Abstract of a paper delivered before the "Engineering Society of Wisconsin," February 22, 1934

THE program of forest products research as viewed by both government and industry today is intimately tied up with the national forestry program as a whole. President Roosevelt has put 300,000 young men to work in the woods, and under his leadership the government is planning and doing things that have made us all more or less forestry conscious. Probably at no time since 1904, when Theodore Roosevelt set aside 100 million acres of public domain for national forests has the public interest in forestry been at such a high pitch. The general concern of the Nation in forestry progress is well registered in the congressional document known as the "Copeland Report." This report, which provides a basis for planning our national forestry program, was prepared by the Forest Service in compliance with a resolution introduced by Senator Copeland of New York and has the endorsement of the Secretary of Agriculture. The Copeland Report is essentially a forward-looking document in relation to the government's larger participation in the solution of our vast forest problem.

This brings us to the question of forest products research and the government's vital interest in forest products research. Obviously, the realization value

¹Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

of the forestry investment will depend to a very large extent on the market value of forest products, and here is where we run across a critical factor in the equation. It is no

secret that lumber consumption in the United States, both in gross and per capita classifications, has markedly declined in the last 25 years, and the enlarged use of wood for pulp, paper, and other uses, has by no means made up for the shrinkage. Uses long held by lumber are being contested both by old materials refined by science and by new materials of scientific origin, promoted in industry with the aid of extensive technical knowledge of their properties. It is no exaggeration to say that the trend of modern technology has been definitely away from wood, and nowhere is it plainer than in the building field, which furnishes over half the market for wood. From roof to basement, the use of wood has been on the down-grade, and the experience of this audience makes proof of the proposition unnecessary.

The quest for markets is of paramount concern in the economic life of today, and it is no exaggeration to say that advance in scientific research is of paramount importance

to modern markets.

The Forest Products Laboratory here at Madison is the central headquarters of Forest Service research in the field broadly embraced by forest consumption and markets. The



Test of a laminated wood arch in the large testing machine at the Forest Products Laboratory.

function of forest products research such as we carry on is clear-cut. Research in other technical materials has meant ever-increasing ability for them to compete with and to replace wood. It stands to reason that a counter-attack of wood research is the only way to insure and strengthen the position of wood in the modern industrial scheme upon which this vast forest reclamation program rests. Our effort must be intensified toward lower production costs, increased consumer satisfaction, more efficient conversion standards, and the development of new or modified products of wide utility from wood. Under the conditions the nation is facing today, we believe that sustained and largely increased research in forest products is basically essential to the success of the forestry investment from a self-liquidating standpoint.

Permit me to enumerate a few of the more recent developments that will interest you as engineers. Aside from the desirability of confining my remarks to developments of particular interest to engineers, there is the fact that normally something over half of all the lumber produced is used in construction. It is evident that improvements in wood use in your field offer broad and direct benefits to economic forestry, forest markets, and forest land use. Wood is a relatively cheap standard building material. The task before us is to improve its economy and performance in fabrication, erection, maintenance, and service.

It is generally recognized that the joints and fastenings are the weak points in a wood structure. What has been done about that? Design data relative to the holding power of nails, screws, drift pins, lag screws, bolts, and similar fastenings have been discouraging to the engineer either because they were unavailable or because of the lack of agreement between various authorities as to safe working values. That situation, I am glad to say, has been very largely cleared up by extensive tests at the Forest Products Laboratory and elsewhere. Much of the information has already been published and more will appear shortly in the form of technical bulletins. Beyond that, the Laboratory in cooperation with the National Committee on Wood Utilization of the Department of Commerce made a thorough study of certain types of modern timber connectors developed in Europe during and since the World War. These connectors consist in general of metal rings or plates which, embedded partly in each member, transmit load from one structural wood member to another. A bulletin presenting the results of this study was published last year and made available working data which point the way to increased efficiency in construction, simplified shop fabrication, and rapid erection.

One of the most effective means of carrying roof loads in a building in such a way as to get large clear floor

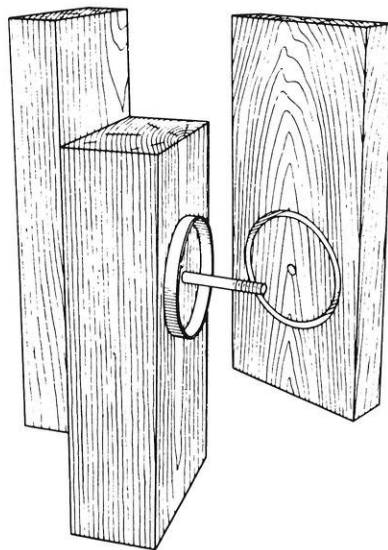
areas is by means of arches, but the usefulness of the arch in wood construction remains undeveloped in American practice. Wood arches are laminated; that is, they are made by bending thin boards or planks around a form to any desired curvature and gluing them with a water-resistant glue. Tests at the University of Illinois and at the Forest Products Laboratory demonstrated the safety of this type of construction and showed that in most instances the initial stresses resulting from bending the laminations to curved form may be ignored in design. Further study, now in progress, is concerned with the type of joints in the laminations, the grade of material, and methods of simplifying design.

It has been demonstrated that columns built up by nailing several planks face to face and tying their edges together with cover plates, or by boxing four planks around a core of low-quality stock, have 70 to 90 per cent the strength of solid columns of the same overall dimensions. This points the way to the utilization of small-dimension material, the proper seasoning of wood without the defects common in large timbers, and the possible efficient treatment of the smaller pieces prior to assembly to resist fire and decay.

Laminated beams with the laminations vertical and bolted together have long been used and, in general, tests show that they are as strong and stiff as solid beams of the same external dimensions. Tests now in progress give promise of the development of glued laminated beams with the laminations horizontal, in which low-grade material may be used near the neutral axis and better material near the top and bottom where the stresses are high. The economy and utility of this type of construction is apparent.

I am sure that all of you have heard of the increasing interest among engineers in the development of composite timber-concrete construction. Experimental work along this line has been confined to the construction and test of beams in which the tensile stresses are taken by the wood and the compressive stresses by the concrete. The problem is to provide suitable means of resisting the shearing force along the planes where the two materials are in contact. Several universities have been making tests of this relatively new type of construction and it is expected that the Laboratory will augment the present information with data still needed. The timber-concrete composite construction has already advanced beyond the experimental stage, and a number of bridges have been erected in the West and South in which it was used successfully.

The use of plywood for engineering and construction purposes has been increasing greatly, and with it has come the need for data on methods of calculating plywood strength. These tests are now in progress at the Forest



A sketch of a timber joint with modern split ring connector in place.

Products Laboratory. Furthermore, plywood has been employed in recent tests at the Laboratory of house wall and floor units. When well nailed to a house frame it contributes great strength and rigidity to the structure, ranking above diagonal sheathing in that respect, which in turn is far superior to horizontal sheathing. A rather interesting possibility of utilizing plywood to a good advantage presented itself in recent experiments with unit floor panels. Plywood sheets were glued to the top and bottom of joists, the top sheets, which were relatively thick, to serve as subflooring, and the bottom sheets, which were thinner, to form the ceiling for the room below. By virtue of its being glued to the joists, the plywood helps to resist the bending stresses, forming what is called a "stressed covering." A considerable saving in material and an appreciable reduction in the thickness of the floor system is made possible with this type of construction.

General research projects now active in the modification of wood properties in the interest of greater permanence, better service, and less expensive maintenance of wood in construction, can be but mentioned in this brief review. New chemicals of considerable promise as wood preservatives are being studied. Substantial progress has been made in the development of new fire-retardant treatments for wood. Painting studies are pointing the way to proper methods of mill priming and greater durability of interior and exterior paint coatings. In the seasoning field, in addition to the continued improvement in air seasoning and kiln drying practices, new treatments involving impregnation with certain salts are being studied which give promise of greatly reducing shrinkage difficulties and materially reducing the amount of degrade accompanying the usual kiln drying.

Plastics offer another notable opportunity in utilization of which the future possibilities may not yet be gauged. "Economic prophets predict that within twenty years the plastics industry will rival steel," says Wilson Compton, Secretary of the National Lumber Manufacturers' Association, in a recent article outlining the needs of wood research. The Forest Products Laboratory's investigations of wood plastics from sawdust have recently taken a more promising turn, and both fibrous and resinous plastics are now being experimentally developed with the aid of phenolic, aldehyde, and hydrocarbon plasticizers. Some of these products show strength comparable to that of natural wood. The field for molded products is constantly broadening, and the future holds a place for wood plastics in such uses as tables, floors, wallboards, and columns as well as in buttons, handles, and dozens of minor manufacturers.

The matter of structural timber grades has always been a troublesome problem to engineers. Today the fundamental principles of strength grading are well understood and the various lumber trade associations have made gratifying progress in setting up grades which conform to these principles. Within the next few weeks a technical bulletin entitled "Guide to Grading of Structural Timbers and the Determination of Working Stresses" will be released which is expected to give further impetus to general improvement in this direction.

In closing I should like to mention but one more item which I think will interest you. For practically all materials with which you deal you have a handbook. Unfortunately, this has not been true for wood. However, the Laboratory now has in the final stages of preparation such a book which will set forth the basic information on wood as a material of construction with data for its use in design and specifications. I need not dwell upon the value of such a publication. I feel safe in saying that it will fill a great need.

The laboratory, as you may well understand, is approaching the problem of increased marketability and service of wood from many directions that wood might become a more thoroughly understood material of engineering in the modern sense.

DENSITY = 62.5?

Dr. N. F. Hall and Dr. Farrington Daniels, both professors in the department of chemistry, are producing a supply of heavy water, or water very rich in the newly discovered double weight hydrogen atom, deuterium. This work is being carried on in the rows of earthen jars in the wire enclosure behind Sterling Hall. A great deal of experimentation with this rare substance is under way in all parts of the country, and the efforts of these men coupled with the aid of the C. W. A. will soon make possible large scale experiments with heavy water at Wisconsin.

The ratio of the deuterium atom to the single weight hydrogen atom is 1/5000 in ordinary water. The concentration of deuterium is best accomplished by electrolysis, in which the lighter atoms are preferably discharged. However, Dr. Hall started his experiment with 1000 gallons of sodium hydroxide solution which he purchased from a local commercial plant and in which the concentration of deuterium is 1/1000.

The electrolytic process, in use now at approximately 30 experimental deuterium plants throughout the country, is at best slow and costly. To effect an increase of four times the concentration, the volume must be reduced by five-sixths or more, depending upon the original concentration. At present Dr. Hall is running 150 amperes through the jars, connected in series, at 125 volts. This amount of power will electrolyze only 12 gallons of solution in a 24 hour day.

Deuterium offers a rich field for experimentation. It may be used to displace the single weight atom in different proportions in innumerable compounds containing hydrogen, making possible and clarifying many so-called exchange experiments. Professor Daniels intends to use deuterium in experiments in photo-chemistry and kinetics. Medical research men are also interested in deuterium, and the old cancer cure rumor is again in the wind.

Some idea of the importance attached to this new isotope may be gathered from the suggestion of Dr. Edward W. Washburn of the Bureau of Standards at Washington, that the Federal Government establish a plant near a source of cheap power to manufacture deuterium on a large scale and sell it at cost to experimenters.

« ALUMNI NOTES »



CIVILS

ZUFELT, JEROME C., '26, is engineer in charge of pumping and filtration at the water works plant of Sheboygan since December 1931. His address is 418 St. Clair Ave., Sheboygan, Wis.

SCOTT, MORRIS J., '31, is assistant to the purchasing agent for the Eagle-Picher Lead Co., Temple Bar Building, Cincinnati, Ohio. He lives at 3810 Edwards Road, Cincinnati.

SCHWADA, JOSEPH P., '11, C.E.'26, City Engineer of Milwaukee, recently had an operation for appendicitis at St. Joseph's hospital in Milwaukee.

JOHNSON, ROBERT C., '17, who recently retired from the office of CWA director for Wisconsin is being mentioned in republican political circles as a possible candidate for the republican nomination for governor. Mr. Johnson, however, does not seem interested in politics and is not encouraging anyone to bring him to the forefront of politics in Wisconsin. He is still retained by the Wisconsin administration of the CWA as an adviser and will likely keep that position.

MARTIN, GEORGE W., '26, is resident engineer for the Green Bay Metropolitan Sewerage District and is in complete charge of the construction work that will be done there during the next two years.

BORRUD, BERTRAM M., '30, visited the college on December 4th. He is an engineer with the Illinois Highway Commission.

ROGERS, HOWARD H., '12, was married to Helen H. Wallace at Oak Park, Ill., on April 5. They are at home in Moline, Illinois.

HELD, WILMER O., '28, is with the County Regional Planning Department of Milwaukee.

THRAPP, HARRISON F., '32, married Mildred C. Vantrot of Durand, Ill. They will make their home in Durand.

HUNDER, MARCUS B., '30, has a position with the U. S. Engineers in Milwaukee. He can be reached at 408 Federal Building, Milwaukee.

KNOLL, CARL, '31, is a recorder on a 200 mile waterway project at Pasadena, California.

KVIATKOFSKY, ROBERT J., ex'31, is now with the Madison Gas and Electric Company as an electric meter tester. He is married and has a son five months old.

WILLIAMS, SIDNEY J., '08, C.E.'15, former chief engineer of the Wisconsin Industrial Commission and present director of the National Safety Council's public safety division, has been borrowed from the council by Harry L. Hopkins, civil works administrator, to watch out for the safety of the 4,000,000 men and women employed on civil works projects throughout the nation. He has had 25 years experience as an industrial executive and is familiar with all phases of accident prevention work.

While at the University Mr. Williams was elected to both Phi Beta Kappa and Tau Beta Pi. After graduation he entered construction work and in 1913 became the chief engineer of the Wisconsin Industrial Commission. Since 1924 he has been connected with the National Safety Council in which organization he gained his greatest prominence. Among his various writings on safety are listed a chapter

on accident prevention for the report of the Hoover Commission on Elimination of Waste in Industry, a chapter on Safety in Kent's handbook, and a book titled "The Manual of Industrial Safety."

OWEN, RAY S., '04, state representative of the U.S. Coast and Geodetic Survey, who gave a report on the work being done in Wisconsin by that organization; **HAMEL, VERNON**, '32, who led the discussion on the proposed revision of the platting law; **TRAYER, GEORGE W.**, '12, who talked on the "Uses of Forest Products"; **BALLAM, H. V.**, '25, superintendent of construction at the Jones Island Sewerage Disposal Plant, who discussed a paper prepared by Charles F. Ball, chief engineer of the Chain Belt Company, entitled "Pumping Concrete"; and **SCHWADA, JOS. P.**, '11, who spoke on "Milwaukee's Water Purification Problem", were civil engineering graduates who participated in the program for the 1934 convention of the Engineering Society of Wisconsin.

CALDWELL, WALTER GAYNOR, '10, 48, state Public Works Administration chief and assemblyman from Waukesha died on January 29 at the Madison General Hospital following 18 days of illness which began with a cold and culminated in pneumonia after an abdominal operation.

Mr. Caldwell, though a prominent engineer, had gained most of his recognition in the political field, his activities

in politics being more recent. He was author of the present state trucking law passed by the legislature in 1933 which requires the licensing and registering of all the trucks in Wisconsin under the supervision of the public service commission, and was instrumental in giving Wisconsin a milk bill that virtually made milk a public utility in Wisconsin. Last summer he was appointed head of the government's \$50,000,000 public works program in Wisconsin and since then has become widely known throughout the state.



—Courtesy Capital Times.

W. G. CALDWELL

Mr. Caldwell was born in Pewaukee in 1886, obtaining his higher education at Marquette University where he received his A. B. degree and later at the University of Wisconsin where he earned his B. S. and C. E. degrees. From 1910 to 1912 Mr. Caldwell worked for the Wisconsin Highway Commission as an engineer in the construction of roads and bridges. For a period of five years after that he was a contractor in Waukesha and then for a time he was employed by the Federal government. In 1919 he was elected highway engineer for Waukesha County which po-

sition he held for two years, and since that time he has been a consulting engineer. One of Mr. Caldwell's main achievements as an engineer has been the special study of land titles and the investigation of land records. Besides his engineering positions, Mr. Caldwell was president of the Waukesha Abstract and Title Co. and a director of the Gaynor Cranberry Co. He was also a member of the Wisconsin Engineering Society, secretary for the board of appeals in Waukesha, and engineer for the county park board and county drainage board.

His election to the legislature occurred in 1933 when he was the first Democratic candidate to defeat a Republican in more than a quarter century.

MINING

KIEWEG, EURTON, '32, M. S.'33, is a civil engineer on Erosion Control Work at Darlington.

HEYDA, CHARLES, '33, is taking a post graduate course in metallurgy engineering at Leland Stanford University.

ERDMAN, EDWARD A., '34, has secured employment at the Wesley Heat Treating Co. in Milwaukee. His address is 161 N. 88th St., Wauwatosa, Wis.

DARGAN, W. V., '15, recently visited his former professors of mining and metallurgy. He resides in Salt Lake City where he is western manager for the Cyanamid Co., and had returned to Wisconsin to visit his home in Columbus.

WHITTINGHAM, PERCY P., '27, visited at the Mining and Metallurgy Building while attending the convention of the Engineering Society of Wisconsin.

LORIG, CLARENCE H., '24, Ph. D.'28, recently spoke in Milwaukee to the American Society of Steel Treathers on subject of the effects of copper on malleable iron.

ARCHIE, G. E., '31, M. S.'33, and **COLE, I. L.**, '31, are both doing CWA work. Mr. Archie is working at Mondovi, Wis., and Mr. Cole is working in Juneau County.

HULTEN, D., '32, is with the United States Coast and Geodetic on a CWA project with Professor Owen.

WOLVERTON, F. M., '20, called at the mining department recently. Mr. Wolverton is city engineer of Oshkosh, Wis., having been selected by the first common council to succeed the older commission form of government.

ELECTRICALS

ANGER, ERNEST GRANT, '33, is now working at the Briggs and Stratton Corp. in Milwaukee where he is doing research and testing work. His address is 7332 Harwood Ave., Wauwatosa, Wisconsin.

AULTMAN II, DWIGHT E., '24, is employed by the Constructing Quartermaster of the U. S. Army at Fort Sill, Oklahoma, as an electrical inspector. His duty is the inspection of all electrical work being done on a large construction job at Fort Sill. He is also assistant to the electrical engineer on the construction and design of an underground electrical distribution system that will replace the present overhead.

BERGHOLZ, EUGENE A., '25, after two years as a designing engineer, became interested in medicine and is now an interne at Milwaukee, Wis.

BOHN, D. I., '21, is an electrical engineer for the Aluminum Company of America in Pittsburgh, Pa.

BURNHAM, GEORGE, '32, is working in the test department of the Allen Bradley Co. of Milwaukee.

CARPENTER, EARL E., '27, has the position of distribution engineer for the Ohio Public Service Co. in Sandusky, Ohio.

COATES, ROYAL E., '24, is an engineer in the transformer department of the General Electric Co. at Pittsfield, Massachusetts.

DONALDSON, CHASE, '18, is president of the Distributors Group, Incorporated.

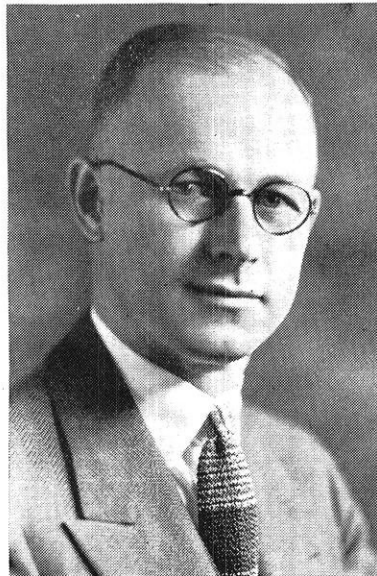
Previous to his present position, Mr. Donaldson was a partner in Bertles, Rawls, and Donaldson Co., buyers and wholesalers of security issues. He became president of the Founders General Corporation, a wholesaling organization for the Founders group of companies, and later, president of the Allied General Corporation, independent wholesale distributors.

ENSMANN, BERNARD, '33, is employed at the present time by the New York Edison Co. in New York City.

FOX, GORDON, '08, has been named a vice-president of the Freyn Engineering Co., consultant engineers, of Chicago, with which company he has been associated since 1920, and since 1928 as the representative in the U. S. S. R.

where he has cooperated with the Russian organization, Gipromez, in developing the steel industry there.

After graduating from the University, where he was a member of Phi Gamma Delta fraternity, Mr. Fox obtained a position as testing engineer with the Northern Electric Manufacturing Co. of Madison. A year later he worked for the Fort Wayne Electric Works of Indiana as a construction and service expert. From 1912 to 1920 he held the successive positions of sales engineer at the Fort Wayne Electric Works, engineer at the



—Courtesy Steel.
GORDON FOX

Mark Manufacturing Co., Evanston, Ill., and electrical engineer with the Steel and Tube Co. of America situated at Indiana Harbor, Ind.

One of Mr. Fox's chief undertakings was that of electrical engineer in charge of the design, construction, and operation of a large steel mill at Indiana Harbor. This work was done while he was with the Freyn Engineering Co., and before he went to Russia.

Mr. Fox has contributed numerous technical articles to the Electrical Review, Power, Railway Electrical Engineer, Power Plant Engineer, National Engineer, and other magazines chiefly on the application of electric motors and control. His other literary works include two books, "Principles of Electrical Motors and Control," published in 1924 by the McGraw-Hill Publishing Co. and "Electric Drive Practice," published in 1928 by the same company.

His memberships in technical organizations include the A. I. E. E., Association of Iron and Steel Electrical Engineers, and the Western Society of Engineers.

HOVE, ADOLPH M., '30, is in Brazil, South America, where he is employed by the Cities Service Co.

ILKER, ELMER C., '31, has a position with the Chicago Transformer Corp. where he is doing design, testing, and development work.

JOHNSON, CARL E., '26, is employed in Dallas, Texas, by RCA Victor, Inc., doing general engineering work on theatre sound equipment.

MARTZ, GUY E., '28, is manager of the public utilities in five small towns in Arizona. He is employed by the North Continent Utilities Corporation.

NELSON, ERIK N., '24, is a distribution engineer at

Massillon, Ohio, under the employment of the Ohio Public Service Co.

HOLMQUIST, ARTHUR S., '26, was transferred in January from production engineer of the Ohio Public Service Co. in Lorain, Ohio, to the service department of the same company at Elyria, Ohio.

HOOVER, CLARK, '24, is distribution superintendent at the Port Clinton, Ohio, branch of the Ohio Public Service Company.

POST, STANLEY D., '28, is working in the Division Employment Supervisor's office of the American Telephone and Telegraph Co., doing engineering work involved in the maintenance of message and program circuits, and the establishment of new circuits.

RABBE, JOHN A., '26, has been employed since graduation by the Proctor and Gamble Co. and its subsidiary, Buckeye Cotton Oil Co. At the present time he is division superintendent in charge of manufacturing at seven mills of the Buckeye Cotton Oil Co. Before receiving his present position, Mr. Rabbe was superintendent of the Augusta, Ga., mill owned by the same company.

RASMUSSEN, C. E., '23, a former business manager of the "Wisconsin Engineer", is employed by the Walker Vehicle Co. of Chicago as sales manager.

RUDIE, LEIF N., '26, is a specification engineer with the Commonwealth Edison Co. of Chicago, Ill.

SOMERVILLE, H. V., '29, works in the radio and photophone divisions of the RCA Victor Co., Inc., as a field service engineer.

THOMAS, M. A., '25, at present is Acting Head of the Electrical Engineering Department of the New Mexico State College.

After his graduation from the University of Wisconsin, Mr. Thomas was employed by the Utah Power and Light Company in Salt Lake City as a hydro-electric power station operator. From 1928 to 1931 he was an instructor of electrical engineering at the University of Texas, in the latter year receiving his appointment as associate professor of electrical engineering at the New Mexico State College.

ZILLMANN, DON H., '28, is located in the operating department of the Northern States Power Company at Eau Claire, Wisconsin.

NORTON, JR., PAUL T., '17, professor of industrial engineering at the Virginia Polytechnic Institute has written an article on economy studies in modern industry in the pamphlet, "Technical Topics," of which Mr. Norton, Jr., is editor.

CHEMICALS

BASH, FRANCIS EDWIN, '16, Ch. E. '17, at the present time is technical manager of the Driver Harris Company in Harrison, New York.

Upon his graduation Mr. Bash, a native of Port Townsend, Washington, secured a position with the Leeds Northrup Company. While with this company he was promoted to manager of the production control department and then was again promoted to superintendent of the furnace department. He holds several patents on improvements for optical pyrometers and has written many articles of an electrochemical nature.

IVERSON, JOHN O., '33, who has been doing CWA work under Prof. O. P. Watts has obtained a position with the research department of the Universal Oil Products Company of Riverside, Ill.

KING, K. Y., '27, together with T. C. Hung published an extensive report on "Proximate Analyses of Chinese Coals," as Bulletin No. 13 from the Sin Yuan Fuel Laboratory, Geological Survey of China, dated July, 1933.

PAUSTIAN, A. F., '28, continues his advances on the engineering staff of the Proctor and Gamble Company, Ivorydale, Ohio, manufacturers of Ivory soap.

RAGATZ, PROF. R. A., '20, and Mrs. Ragatz announce the arrival of a son on January 31, 1934.

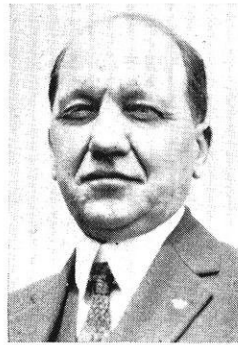
HEARD, GEORGE G., '34, upon completing his course in February obtained a job in the research and development department of the Sinclair Refining Company, East Chicago, Indiana.

MECHANICALS

PAGENKOPF, WALTER H., '26, is with the Western Electric Co. He and his wife, the former Margaret Sniffen, '28, live at 604 S. Stone Ave., in La Grange, Illinois. They have a daughter, Ann.

MORTENSEN, MARTIN, '31, Niagara Falls, married Janet Larson, '31, of Whitehall on December 27 at Whitehall. They are living at Niagara Falls where Mr. Mortensen is associated with the Kimberly-Clark Co.

ZIMMERMAN, COL. OLIVER BRUNNER, '96, M. E. '00, who was assistant to the manager of the engineering department and supervisor of materials for the International Harvester Co., has retired from active interest in the affairs of the company with which he has been connected since 1911, except for a period during the World War.



—Courtesy S. A. E. Journal.

O. B. ZIMMERMAN

For five years after graduation, Col. Zimmerman was instructor and then an assistant professor of machine design at the University. He left this position in 1905 to become assistant superintendent at the R. J. Schwab Co. in Milwaukee. He secured positions with several other concerns until he became connected with the International Harvester Co.

DREWRY, M. K., '22, former editor of the "Wisconsin Engineer" and now assistant chief engineer of power plants at the Milwaukee Electric Railway and Light Company, has written an interesting article on Low-Cost Air Conditioning for a Small Residence in the January 1934 issue of the Heating, Piping, and Air Conditioning magazine.

LARSON, PROF. G. L., M. E. '15, as president of the Engineering Society of Wisconsin, gave the welcoming address at the convention.

* * * * *

CAMPBELL, FLOYD D., ex-'14, vice-president and general manager of the Staten Island Edison Corporation since 1929 was elected president and a director of that utility.

Mr. Campbell has been identified with the Associated Gas and Electric System for several years. He went to Staten Island from the Broad River Power Company, Columbia, S. C., where he was general manager.

From 1912 to 1918 he was associated with several casualty companies in various capacities on investigation and inspection work in the industrial and construction fields. Following the war he was employed by the W. S. Barston Company, engineers, and was engaged in general construction work on electric generating plants and gas plants on the properties of the General Gas and Electric Corporation. From 1924 to 1927, until he went to the Broad River Power Company, he was general manager of the Pennsylvania Edison Company and assistant general manager of the New Jersey Power and Light Company.

State Engineers Hold Record Meeting

THE outstanding feature of the twenty-sixth annual convention of the Engineering Society of Wisconsin, held on February 22 and 23 in the Engineering Building at Madison, was the large registration and attendance.

* * * *

At the end of registration there were 223 names on the book. The attendance at the meetings ran far beyond that figure, being swelled by the presence of numerous students and others who did not register.

* * * *

Secretary Owen reported 331 members in good standing on the day the meeting began. This was a net loss of eight during the year. Approximately 20 new members were added during the meeting.

* * * *

Finances are in good condition although the dues were reduced for the past year from four to three dollars. Cash on hand increased, as did the surplus, which is now \$2392.29.

* * * *

The society lost five valued members during the year: W. G. Caldwell, T. F. Cunningham, T. Chalkley Hatton, P. G. Hurtgen, and C. V. Kerch. Kerch was the second president of E. S. W., back in 1910. Hatton was the tenth president, in 1918.

* * * *

The proposed revision of the state platting law, which had been prepared and presented by Vernon S. Hamel, a graduate in both law and engineering at Wisconsin, provoked much discussion. It was impossible to reach an agreement during the time available for its consideration.

* * * *

About 80 engineers crowded into the banquet room of the University Club on Thursday noon for luncheon to hear Prof. John D. Hicks, of the university history department, give some intimate personal details about George Washington.

* * * *

Facilities were strained to handle the crowd at the joint meeting with the Technical Club at the Congregational Church on Thursday night. The Mozart Club, which has become a traditional feature of this meeting due to the numerous engineers who sing with that organization, entertained as delightfully as usual. Prof. Swinney directed the Club and sang a duet with Miss Johnson.

* * * *

A. L. Boley, the new president, was a bit astonished to receive a congratulatory telegram from Sheboygan about ten minutes after the election took place.

Prof. H. F. Janda was elected vice-president, and Robert C. Johnson and C. A. Willson were elected trustees for a two-year term. Prof. Owen was reappointed secretary by the new board.

* * * *

Chi Epsilon, honorary civil engineering fraternity, handled the registration table. The following juniors and seniors were on duty at the table: B. H. Randolph, Edward Neroda, W. C. Lefevre, J. A. Rhodes, R. C. Price, H. C. Trester, E. W. Gradt, Arthur Lemke, Lloyd Dysland, Laurence E. Bidwell, R. T. Dittman, R. A. Schiller, and P. H. West.

* * * *

The luncheon served Friday noon in the mechanical engineering building was prepared and served by students and faculty members under the direction of Prof. Ben Elliott.

* * * *

Prof. B. G. Elliott, L. P. Atwood, and L. J. Markwardt served as a nominating committee. Robert M. Connelly, C. A. Willson, and L. F. Van Hagan wrote the resolutions. W. H. Tacke, and W. S. Cottingham audited the secretary-treasurer's accounts.

* * * *

George H. Randall, for many years city engineer of Oshkosh and experienced in land surveying, castigated the Wisconsin Highway Commission for being "the worst offender in removing monuments."

* * * *

Chaining to an accuracy of one in 40,000 was demonstrated by a survey party on the platform of the auditorium of the engineering building. Ben King, former city engineer of Watertown was party chief. The work is being done under the U. S. Coast and Geodetic Survey C. W. A. project in Wisconsin.

* * * *

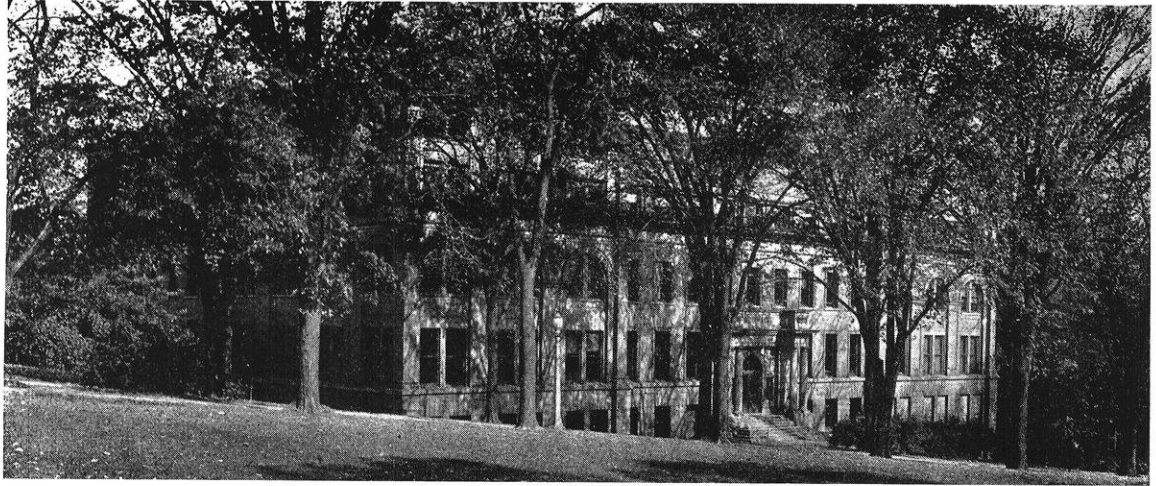
Of the 167,000 men on the C. W. A. payroll in Wisconsin, 32% are working on highways, 16% on parks, 11% on schools, and 10% on city streets, according to A. P. Patterson, project engineer for C. W. A. in this state.

* * * *

Wisconsin was one of four states that had a lower death rate from highway accidents in 1933 than in 1932, according to E. J. O'Meara, traffic engineer for the Wisconsin Highway Commission.

* * * *

The federal and state forest program means permanent jobs for 2,000,000 men. George H. Trayer, senior engineer at the Forest Products Laboratory, told the convention.



« CAMPUS NOTES »

FRESHMEN ENGINEERS HONORED

As in past years, the Freshmen are upholding their end of the scholastic activities of the College of Engineering. The following men have been working at the high honor and honor rates:

High Honor Rate

	Credits	Points
Mayland, Harrison C.	19	57
Eppler, John Frederick	17	51
Olson, Neal Dempster	17	51
Parrot, Frank Willis	17	51
Buroughs, Chas. Wm.	18	53
Wilson, Francis Curteus	18	48
Luecker, Arthur Rowe	16	46
Risser, Gerald Jenson	17	47

Honor Rate

Wilson, Francis Curteus	18	48
Fontaine, Francis Ephraim	17	45
Pryor, Wm. Alexander	17	43
Schuele, John J.	17	43
Wefel, Ellison Leslie	17	43
Durdell, Wm. Rex	19	46
Norris, Spaulding Arthur	17	41
Heinrichsmeyer, Ed. F.	18	43
Carlson, Lawrence W.	17	40
Storck, Norman Casper	18	42
Ingersoll, Hugh David	18	42
Rindahl, Hjalmer Theo.	15	35
Rudolf, Chester Davis Jr.	17	39
Richardson, Stephen	17	39
Brubaker, John Vernon	17	39
Wefel, Walter George	17	39
Christl, Robert Jos.	18	41

WATERWORKS MEN MEET AT U. W.

The annual four-day short course for superintendents and seniors employees of water departments was held by the Hydraulics Department of the university from February 20-23 inclusive.

The state's water department considered problems of various kinds of pipe and connections, and also study the chemistry of water analysis and purification. A series of 15 lectures were delivered during the four days. The course was under the supervision of Prof. F. M. Dawson and was held in cooperation with the hygienic laboratory of the State Board of Health and the Wisconsin league of Municipalities.

ST. PAT TO RULE AGAIN



Lawyer Going to War

CHI EP BOYS USHER AT CONVENTION

The members of Chi Epsilon, honorary Civil Engineering Fraternity, did the honors as ushers at the annual convention of the Wisconsin Society of Engineers held here the week-end of February 23-24. According to tradition, the ushers' job will always fall to the lot of Chi Epsilon, and according to officials of the Society, it has always been adequately and courteously fulfilled.

SIDE-LIGHTS

A bewildered engineer was seen in the Greek quarter one Monday evening and questioning passers-by. It seemed that he couldn't remember the location of the frat he had pledged the week before.

And then there's Don Blankley who used a half of a box of (somebody else's) matches in the physics lab trying to light a Bunsen burner connected to the compressed air jet.

SNAPPY COMEBACK 4908 FROM A CHEMICAL

Professor Kowalke: "Well, Mr. Feiling, you look pretty wise this morning, suppose you answer the question."

Brunow Feiling, '35: "Please sir, I didn't mean to look wise."

STATE SURVEYS TO BE STOPPED

The Wisconsin Survey, of March 3, a weekly bulletin devoted to the interests of the present CWA State Surveys, announced that the survey had been approved as a State Project with a quota of 220 men. This quota is 100 men less than the previous limit. The lease of life for the survey, however, is only for one month, and all work must be completed by March 31.

Up to February 15, the survey reports a total of 528 monuments set, 252.25 miles of levels run, and 246.50 miles of taping completed. Although the completion of a network of surveys covering the state is now impossible, the work already done is completely referenced, and will be valuable in the future.

THREE-DAY RADIO COURSE TO BE GIVEN AT MILWAUKEE EXTENSION THIS MONTH

The annual radio short course conducted by the University of Wisconsin Extension Division will be offered on March 26-28 inclusive. This course, under the direction of Sam Snead, is designed to furnish a better understanding of the more important of the latest phases of radio development.

Topics to be covered include new sets, new circuits, testing equipment and methods, public address systems, television, facsimile, iron-clad mercury arc rectifiers, radio applied to aviation, x-ray in industry, and photo-electric cells. Trips will be made to some of the largest electrical plants in the world which are located in Milwaukee.

"WISCONSIN APPROACH" IS BY-WORD AMONG "NEW DEAL" WORKERS

Participation of University of Wisconsin graduates in the federal government's work in Washington is growing steadily in public works, relief, labor advisory board, central statistical board, and the economics division of the N. R. A., it has been learned.

Those on the "inside" at the nation's capital say that, in contrast with men from other schools, the state university's graduates usually display not only a sound understanding of principles, but a practical way of dealing with problems arising under the new order of things. Knowledge of this fact has become so widespread that it has been given a label all of its own—"The Wisconsin Approach."

ENGINEERS TAKE PLUNGE INTO MATRIMONY



March

Richard Huzarski, c'34, was married to Miss Mary Turner of Madison in the Unitarian Church on Sunday, March 4. Unfortunately, Dick's parents were unable to be present, but they sent their best wishes in a telegram from Warsaw, Poland.

Paul H. West, c'35, was married to Miss Mayre Teckemeyer in the St. Raphael's Church on Saturday, Mar. 3.



July

WESTINGHOUSE RESEARCH MAN LECTURES TO ENGINEERING STUDENT BODY

Mr. M. G. Baker, m'28, of the Westinghouse Research Laboratories, delivered a lecture on "Mechanical Vibrations" on February 7 in the Hydraulics Laboratory.

Mr. Baker dealt with vibration principles in a simple way, and amply illustrated his talk with models and sketches. Work in this field has been carried forward in recent years because of the growing number of problems arising in connection with the increasing use of machinery in industry. These problems are essentially complex outgrowths of the well known problem of the bridge which collapses due to the tramp of marching feet. High speed machines are particularly susceptible to such vibrations.

ENGINEERS BEAT BOOK RACKET

Several senior engineers recently were "taken in" on a new and slightly revised edition of an old racket. This

item is printed as a matter of information and not to embarrass those who were worked. The racket is promoted with the aid of a slick salesman, an appeal to the prospect's vanity, and an offer to give him something for nothing. The salesman, after getting in to see the prospect by various means, reveals that he has come solely to get a recommendation for his book from the prospect. In return for the recommendation, which is to be used as evidence to other students of the worth of the book, the book company will donate a set of expensive books, usually encyclopedias or some similar material. All the prospect has to do to get these books is to sign the recommendation. The recommendation, written out ahead of time, contains a clause in fine print stating that the signed will accept and pay for the books, or will accept the books and pay for an information service which will keep the books up-to-date for the ensuing ten years.

The cost of the service is equal to the ordinary cost of the books, and the same service is rendered free to anyone purchasing the same books through the regular channels. The books are apt to cost anywhere from \$30.00 to \$60.00 depending upon the salesman.

In this case, although the signed contract is legally binding, the students have refused to accept the books, and so far have not been sued for the money.

Incidentally, there were also several lawyers and a group of medics who were hooked in addition to the engineers.



PRESS DISPATCH

Mechanicals are working on floats and armament for the St. Pat's parade. The sketch shown above portrays the latest device concocted.

« « EDITORIALS » »

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CONVERSE COMMENT

Written in opposition to the editorial, "Stick Your Neck Out," in the November issue.—EDITOR.

Dear Mr. Editor:

You remember that at the convention dinner of the Engineering College Magazines, F. R. Innes, editor of the *Electrical World* and propagandist against government power development, in the main speech of the evening rejoiced in the dense crowd attending the affair, but hesitated to express his delight at the large turnout for fear of the loud voice in the back of the room, "Don't be too pleased, mister, we aren't all dense." Here is that voice.

For whom is power being generated? Is it so that we students can cook our meals in our own rooms or study to the strains of "Temptation" coming over our roommate's radio? Or is power generated for the purpose of turning the wheels of industry? Is it not true that neither of these is the dominating purpose, and is it not evident that power companies are eager to serve consumers only insofar as service increases profits?

The Tennessee Valley Authority proposes to establish a measuring stick in its power system to determine how high costs of generating electricity should be. If the American public has been paying too dearly for its power, there seems to be good reason to believe that private power would resent this venture. But if the companies of the power trust have not been reaping exorbitant profits, they should invite comparison of rates to restore public confidence in the willingness of big business to be content with a reasonable return on the investment. Of course the TVA does more than generate power. Floods will be alleviated, reforestation will give impetus to our forest replanting which is badly needed, navigation through the

shoals will be made possible, decentralization of industry will be tried, and farmers marooned on submarginal land will be assisted in making a new start on tillable soil.

Colonel Doty, Daniel Mead, and other eminent engineers have been frank and sincere in their criticism of the government projects being undertaken at various strategic points about the country, such as the hydro-electric developments at Muscle Shoals and at Boulder Dam. Yet even Morris Cooke, who is himself against government ownership and operation of power utilities has sounded a note of warning. In laying out a program for power utilities, you recall that he said: "Industry must discard misleading propaganda. It must realize that anything it now says is suspect and that the money spent in spreading abroad misstatements of fact is largely wasted. It is vital that it cease attempting to utilize professional organizations as well as engineers as mouthpieces for its propaganda. That the pressure brought by utility executives upon these organizations has been and is effective cannot be denied, and the public will not be slow in placing the blame where it belongs if the integrity of these professional organizations is destroyed."

The Tennessee Valley Authority needs no defense. The southern power companies, when once they had realized the potential power output of Muscle Shoals, did their best to secure ownership of the site for themselves. But, shades of sour grapes, now that the government is developing the site, the power companies point to the fact that "in their opinion," the power will not repay its development. TVA is more than a power development; it is a beginning in national planning, and the planning is for the benefit of the American people.

Engineers must lead. But will we not be more successful as engineers if we assist in developing the great resources of our country cooperatively under the incentive of a goal of planning for all, as the president has proposed, than if we

try to revive the *laissez-faire* economy? So how would it be if we set out in that direction instead of turning our eyes wistfully in the direction of the dead past? Engineers have given modern civilization its material gifts and have been plunging ahead without dismay in technological progress; now can they show themselves as adept in counseling the use of their gifts to mankind?

Respectfully yours,

AN ENGINEER.

CHANGING THE OIL With this issue the masthead of the *Wisconsin Engineer* shows the induction of new members to carry on the work of the old for the ensuing fiscal year beginning with this semester. Perhaps the most significant fact of a changing staff is the evidence of the slow transitional flow of thought and policy that can be so clearly traced even through the issues of the last three years. When transition takes place one can always look forward to forthcoming progress for in new machinery there lies new available energy.

The outgoing members have done their work. Some oil that has served its owner for many miles leaves the crankcase with its lubricating qualities almost intact. So have the senior members of the staff shown that they could cooperate and give of their time and energy for presenting professional and current news to their fellow students without yielding under the load of schoolwork and activity. As a reward may the experience they have obtained stand them in good stead following graduation.

TRADITIONAL CALLS When spring is just around the corner the rumblings of the wheels of a St. Pat's parade become audible. The success of the parade last year can be directly attributed to the spirit of genuine fun with which the project was finally carried out. May this year's activities again minimize the ulterior motive, but emphasize all the more the need of a higher degree of careful planning in the execution of the parade. If the parade becomes a decidedly permanent tradition, it is imperative that some organization or group take active leadership in being directly responsible for the organization of the project early in the season. Until now the planning has been rather decentralized—the result of spur-of-the-moment organization. The group which has the foresight to see the possibilities of the tradition should make an attempt to take the helm and feature the parade as their own activity.

At the last graduation exercises a trivial though significant incident illustrated the trend in attitudes between the campus foes. As is the custom, the two groups skyrocketed each other lustily, but the captions were unconventionally *Lawyers!!* and *Engineers!!* respectively. This incident should not be taken to indicate a lessening of the spirit existing between the schools but should be an indication that the groups are willing to meet on a ground of battle somewhat higher in the scale of decency.

As engineers let's give them both barrels, but we can undoubtedly achieve a good deal more by meeting them on the plateau rather than in the gutter.

IN UNITY THERE IS POWER

A plan is being formulated at the present time to amalgamate the student activities of the college of engineering in order to give its students a more complete program of extra-curricular participation. The proposed plan in its present form is one of organizing a central board composed of the treasurer of Polygon, the business manager of the *Wisconsin Engineer*, and a member of the faculty, holding office for a long term, which board is to supervise the collection and allocation of a fund to be used in operating Polygon, A. S. C. E., A. S. M. E., A. I. Ch. E., A. I. E. E., Mining Society, and the *Wisconsin Engineer*. Under the plan a fee paid by the student upon consultation with his advisor would entitle him to junior or senior membership in the student branch of the professional group under which he is classified, a current subscription to the *Wisconsin Engineer*, and free admission to all functions sponsored by Polygon, including all dances and smokers. With the financial support brought into being by this fund the professional societies could come into genuine good standing with their students of their branch of engineering and could become vital factors in organized professional fellowship so desirable in engineering work. Through the plan the *Wisconsin Engineer* and Polygon could become even more instrumental in serving the entire student body. Under the tentative plan the membership fee for this all-student organization covering the privileges listed is set at one dollar per semester, which will net every student value received if he will but accept the benefits that will be at his disposal. In a community of about nine hundred students, all of whom are united in a more or less common educational interest, a central organization of this kind could go far in bringing about a crystallization of student opinion that could be reflected in a distinct voice in the university's organization. Collective problems such as the curriculum, student interests, and employment after graduation, could be more intelligently discussed and disposed of by societies whose membership rolls were representative and whose treasuries could boast of health and vitality. When the plan is complete its careful and favorable consideration by faculty and students alike will undoubtedly result in the unification of the college that may be classed as a major step in furthering student welfare.

SOME RULES TO SUCCESS

First—Eliminate from your vocabulary the "perfunctory." Every task is a test.

Second—Remember that the most serviceable of all assets is reputation.

Third—Think. Exercise the springs of your brain.

Fourth—Work hard. Presumably you have ideals; keep them. Don't lose faith.

Fifth—Take an interest and a due share in public affairs.

Sixth—Meet your fellow-man with confidence, unless you have reason to suspect.

—Otto H. Kahn.

« CAMPUS ORGANIZATIONS »

POLYGON SOCIETY

Possibilities for a stronger unification of the engineering school in the near future are approaching realization. Polygon Society has been formulating the plans for a radical change in the activities that engage engineers such as professional societies and the engineering school publication, the *Wisconsin Engineer*. Under the new scheme the freshmen will be introduced to the various activities of the school early in their school careers. Every student in the engineering college will be a member of the student professional society of his particular group and so will have the privilege of participation in all society meetings, smokers, and dances. The plan also involves securing a wider circulation for the *Engineer* by providing a copy for all engineers. These provisions will assure the student a chance to profit more fully from the contacts and intellectual acumen that may be gained through a unification of college activities. It is possible that the new system will be put into effect at the beginning of next semester.

Plans for the annual spring dance to be held at the Memorial Union on April 20 are also being made by Polygon. Tentative proposals are for the gentlemen to pay for their lassies on a weight basis, height basis, color of eyes or hair basis, or what have you. At any rate you will enjoy the dance again this year; so get you dates early and not too heavy.

CHI EPSILON

The last issue of the *Transit*, honorary civil engineering fraternity publication, contains an incisive analysis of the accomplishments of honorary societies by Prof. Kaulfuss of Penn State College. His observation has been that perpetuation alone seems to furnish the "reason for being" of several honorary groups. An explanation lies in the fact that the membership of most honoraries consists chiefly of seniors who do not begin to assist in the fraternity work until they are occupied by divers outside interests during their senior years; then they are satisfied with mere perpetuation. A more productive life might be engendered by analyzing positive constitution purposes and by adoption of an adequate scheme of activity to carry out the intentions of the founders of the society. Furthermore, it might be wise to charge the newly-elected juniors with the duties of carrying out the program, of planning for initiation, of cooperation with other engineering groups, of pondering the best ways to meet the needs of the students. Just as a student should expect more from a college than credits and grade points, than merely a way to make a living, so should the honorary society accomplish more than sole existence. To be is not enough.



MINING CLUB

At the next meeting of the Mining Club plans are to be made for the St. Patrick's parade float. It is tentatively planned to have a CWA man speak to the group on the progress that the civil workers are making on the experimental research in mining and metallurgy.

Election of two members of Mining Club to represent the club in Polygon and election of a new treasurer to replace John Gillett, who has left school, will occur at the next meeting also.

PI TAU SIGMA

Election of officers of Pi Tau Sigma, honorary mechanical engineering fraternity, was conducted at a chapter meeting on Feb. 7. The officers for the current semester are as follows:



President ----- Laverne F. Lausche, m'4
Vice-President ----- Robert M. Rood, m'4
Corresponding Sec'y -- W. J. Van Ryzin, m'3
Recording Sec'y ----- A. J. Simpson, m'4
Treasurer ----- O. C. Frank, m'4

Plans are being made for a spring picnic after inclement weather has loosed its grip.

A. S. C. E.

"Before a civil engineering graduate become eligible for registration in Wisconsin he must have worked in some responsible position for three years," said L. F. Van Hagan, a member of the State Board of Examiners, in an address presented before a meeting of A. S. C. E. held in the Union February 20.

There are three methods of satisfying the requirements for registration, by passing an examination, by presenting suitable exhibits of work, or by reciprocity from states that have made registration transfer agreements with Wisconsin. The method most suitable for college graduates, in the opinion of Professor Van Hagan, is that of presenting exhibits of work to the board for approval.

A short discussion of the automatic cone valve and the merits which have led to its use in the Riverside Pumping Station of Milwaukee was given by C. O. Clark, c'34.

Motion pictures to be shown soon at an A. S. C. E. program are now being selected from a list of interesting films.

If a man write little, he had need have a great memory; if he confer little, he had need have present wit; and if he read little, he had need have much cunning to seem to know that he doth not. Histories make men wise, poets witty, the mathematics subtle, natural philosophy deep, moral grave, logic and rhetoric able to contend.

—FRANCIS BACON.



In five places at once —by telephone

Conference telephone service—a new telephone convenience—enables a number of people far apart to talk together as freely as though gathered around a table.

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BELL TELEPHONE SYSTEM



WHY NOT SAY "HELLO" TO MOTHER AND DAD?
—RATES ARE LOWEST AFTER 8:30 P. M.

UNIQUE MOTOR USED TO TEST AIRCRAFT PROPELLERS FOR NOISE

A new type of "zeppelin" recently arrived at Langley Field in Virginia. Although it is a bit too heavy to ever leave the ground, this new craft may prove to be an important factor in the development of aircraft propellers in the future.

It is an induction motor housed in a cigar-shaped steel casing, with a shaft extension for the direct mounting of



—Courtesy General Electric Company.
Induction motor used to test airplane propellers.

a propeller. It will be used to investigate the noise made by the various types of propellers, with a view to designing a propeller in which the noise is reduced to the practical minimum.

To meet this purpose, the motor had to be designed so that its speed could be very accurately controlled over a range from

1000 to 3600 rpm. This is accomplished by means of two complete sets of 13-point drum control, electrically connected so that one acts as a vernier between each pair of points of the other. A small generator mounted inside the casing is connected to a distant meter, calibrated to indicate the exact speed of the motor in rpm.

As the propeller is tested, the sound waves are received by a microphone and analyzing apparatus so that a complete study of noises can be made. To make it possible to receive the sound waves emanating from the various angles of the blades without having to move the microphone equipment, the motor is mounted on a swiveling pedestal. Both the pedestal and casing are streamlined to reduce resistance to the air stream and to minimize the reflection of sound waves.

The motor itself is probably the first of its kind ever built. It is of the wound-rotor induction type, rated 200 horsepower at 3600 rpm. It is of 2-pole, 3-phase design and operates at 60 cycles and 2300 volts. The motor fits snugly into the 30-inch diameter casing and is of weather-proof construction as the equipment will be mounted outdoors. The swivel trunnion is mounted in a heavy concrete base.

It is a good time for the saloon to come back now because all the good corner locations formerly occupied by banks are now available.

THE ASH HEAP

A certain prominent collegian wandered into a tennis tournament and sat down on the bench.

"Whose game?" he asked.

A shy young thing sitting next to him looked up hopefully. "I am," she said.

—N. D. State Engineer.

I VISH I VAS YOU

A German, addressing his dog, said: "You vas only a dog, but I vish I vas you. Ven you go mit der bed in, you shust durn round dree times und lay down. Ven I go mit der bed in, I haf to lock the blace und vind de clock und put the cat oud und undress myself, und my wife vakes up and scolds me. Den der baby cries und I haf to walk him up and down, den maype ven I shoust go to sleep, it's time to get up again. Ven you get up you shoust scratch yourself a couple of times, stretch, und you vas up. I haf to quick lite de fire, und put de kettle on, scrap vit my wife already und maype get some breakfast. You blay all day und haf blenty of fun. I haf to work all tay and haf blenty of drouble. Ven you die, you vas dead; ven I die, I haf to go to hell yet.

A young men stepped up to the hosiery counter in a department store and asked to see "the thinnest thing you have in silk stockings."

Clerk: "Sorry, sir—but she just stepped out to lunch."

—Rose Technic.

TEN WAYS TO FLUNK A COURSE

1. Do not do any more work than you are forced to do; learn to do only what you think is necessary to get by.
2. Hold a grudge against your instructor and blame him for the lack of progress; perhaps you can make others believe it.
3. Stay away from your instructors; by all means waste no time in conference.
4. Study by keeping two things on your mind at once. It will broaden your ability.
5. Listen to half of your assignments and borrow the other half from three of your neighbors. You will have one-third of it right.
6. Start your work on a given task ten minutes before class. It teaches you to hurry, and to be hopeful.
7. Do not organize your time. You might get all of your work done on time.
8. Be satisfied with half of the facts and hope that you will never be bothered with the other half.
9. While studying in the library, notice who enters. It is well to know your associates; a foe may take you unawares.
10. Think more of your ability as a "wise-cracker" than as a student; you may return to the home town some day and be the village half-wit.

—Nebraska Blue Print.

The Wisconsin Engineer

GREETINGS . . .

to the

Engineering Society of Wisconsin

May we offer our congratulations in lieu of the distinctive progress made by your society during the past year.

We trust that we may be of service to your organization in the future, and that we may respectfully place our facilities at your disposal.

The Wisconsin Engineer

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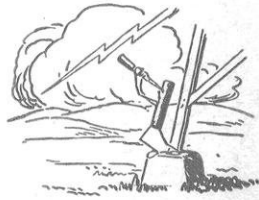
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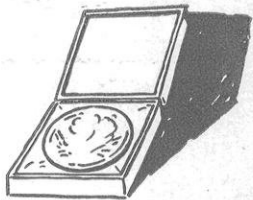
G-E Campus News



LIGHTNING SPIES

How many amperes are there in a bolt of lightning? Well, there are too many for comfort, and most of us are willing to let the matter rest there. General Electric engineers, however, were very much interested in knowing, so that they could better protect electric transmission lines and equipment from damage by lightning. And last summer they sent out over 2000 little spies. These spies are metal cartridges, hardly an inch long, which were placed on the legs of transmission towers on lines in Pennsylvania and Virginia. This territory is apparently one of lightning's favorite hangouts. When the surge from a lightning bolt passes through a transmission tower, the little spy is magnetized in proportion to the highest current in the bolt. Linemen carry the magnetized spies back to headquarters, where, when placed in a "surge crest ammeter," they tell their story. Many scores of the little spies have reported, and their stories are really shocking. The highest reading has been 60,000 amperes.

Clifford M. Foust, Carnegie Tech, '21, and Hans P. Kuehni, Ecole Polytechnique Fédérale, Zürich, '20, of our General Engineering Laboratory force, were responsible for the spies and the meter to make them talk.

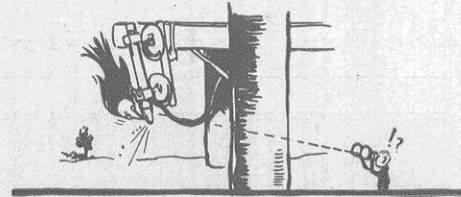


KEYS, MEDALS, AND RESEARCH

The engineers and scientists of the General Electric Company have individually received many keys of honorary societies, medals, and other tokens. On February 1, however, General Electric received a medal to hang on its collective chest. The donor was the 100-year-old American Institute of the City of New York. And the citation read: "For pioneering in industrial research . . . for great achievements

in pure science that have furnished gainful occupation for thousands of workers and that have raised the standard of living, and increased health and happiness."

We mention this with pardonable pride, fully aware, however, that medals and honors are not the purpose of research. The real purpose is the discovery of fundamental facts at the border line of man's knowledge. The practical applications are worked out later. It was with this conviction that Dr. Willis R. Whitney, M.I.T., '90, Ph.D., Leipzig, '96, now vice-president of the company, in charge of research, organized the G-E Research Laboratory in 1900. In maintaining this tradition, he is ably assisted by Dr. W. D. Coolidge, M.I.T., '96, Ph.D., Leipzig, '99, the present director; Dr. Irving Langmuir, Columbia, '03, Ph.D., Göttingen, '06, last year's winner of the Nobel prize in chemistry, associate director; Dr. Saul Dushman, U. of Toronto, '04, Ph.D., '12; and Dr. A. W. Hull, Yale, '05, Ph.D., '09, assistant directors.



SOUTHERN SLEUTHING

Not since Cock Robin have our feathered friends figured in a real good mystery, until the other day. And this was not so much a case of violence as of mistaken identity. Down in South Carolina, a power company had been having a little difficulty. It seems that the cutout fuses, which serve the same purpose on electric distribution lines that fuses do in our homes, were blowing out without apparent reason. Finally, an engineer with a Bird Club in his past unraveled the mystery. He saw a bird pecking at the soft fuse wire, apparently having a fine time. (It wasn't a G-E fuse.) Breathless investigation showed that other circuits had been opened in a like manner.

A G-E salesman on his next call recommended our new fuse links. Having copper in that part which the birds attacked, they proved to be im-peckable, and the trouble ceased. Now the birds are concentrating on worms, the power company on G-E fuse links, and everybody is happy.



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