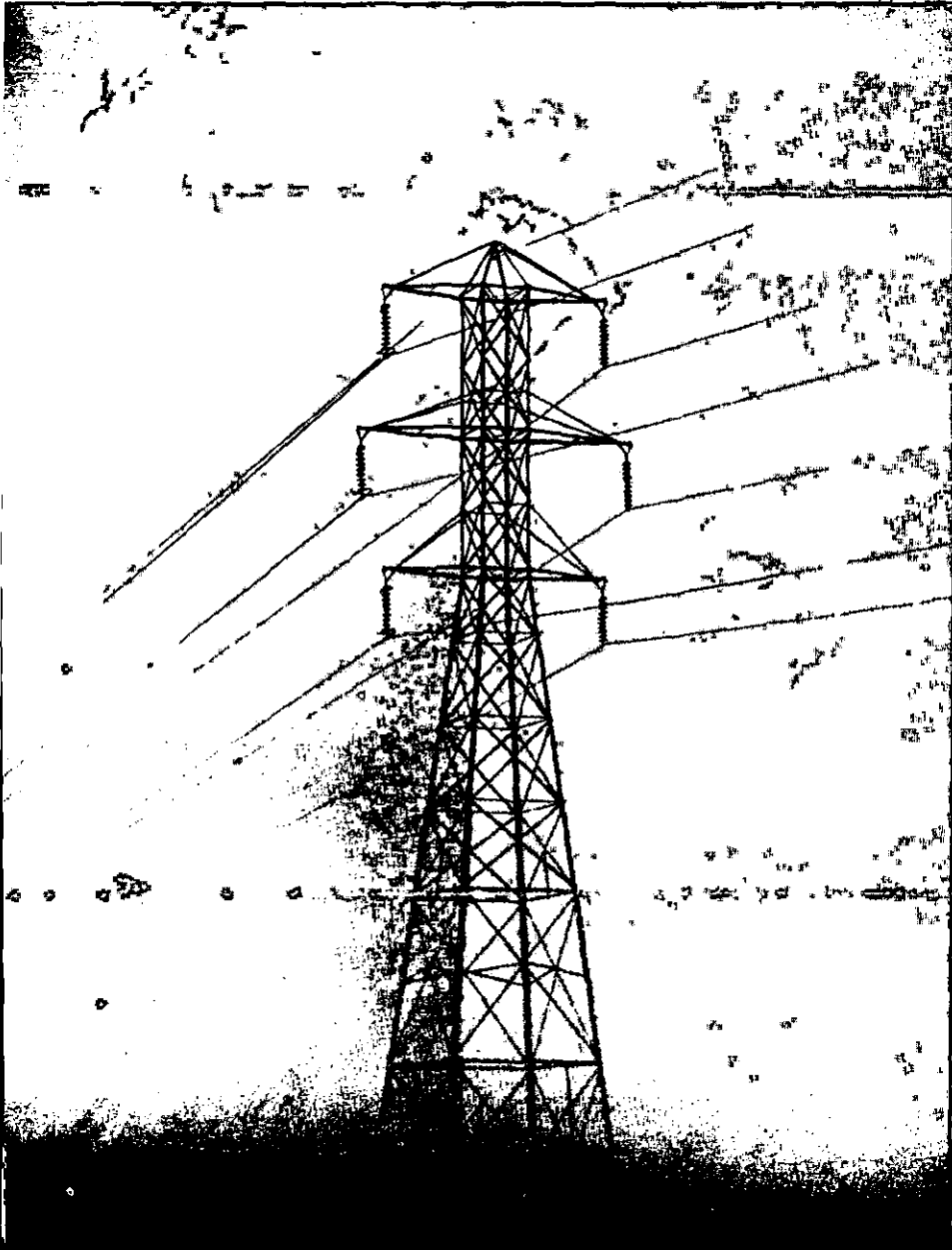


# B & T Engineers NEWS

A DIGEST OF ENGINEERING DEVELOPMENTS

C&F



## Mr. H. R. Crago

General Electric Company

TO SPEAK AT THE

### Nov. 19 Meeting

Dinner at 6:30 P. M.

Meeting at 8:00 P. M.

Chamber of Commerce



### "Never Too Little or Too Late"

*(War Story of Public Utilities)*



### "The Electron Microscope"



### "Carlson Cries for Cash"

*(Dues Are Due)*

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# Engineers News

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Professor Wiley's talk in September and the facts about the Kilgore Bill given by Mr. Hawgood at the Oct. 6 luncheon, constitute a real challenge to all engineers. The average engineer is an individualist. He likes neither to be led nor pushed into decision or action; he likes to make his mind up in his own good time and through his own individual reasoning. The time for individual action is long past. Engineers must *act* collectively in the interests of their profession and the furthering of their individual careers. Engineers need strong, aggressive leadership and the willingness to act collectively for the collective good.

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### PRESIDENT'S MESSAGE

Although we have a November 19 meeting, announced in this *News*, which should be a good one and should be well attended, I believe it behooves us to begin thinking about the December meeting.

~~Engineers are, to their everlasting disadvantage, an unsocial group. One of the avowed purposes of the Fort Wayne Engineers Club is, to quote our constitution.~~

*"To promote closer union and cooperation among the members by professional and social intercourse."*

This one meeting per year is kept completely devoid of business, has no technical or professional program, but is designed for pure entertainment and social contact. I urge you to now plan to be on hand for the December 16 meeting. Come early, mix with the other fellows before the formal (?) program, and then plan to stay late, play cards, talk or what have you, and have a good time. Every member should plan to make the acquaintance of at least twenty fellows whom he has not previously met. Don't forget, December 16, Chamber of Commerce.

P. S.—Free Lunch.

### HARRY R. CRAGO TO SPEAK

Mr. H. R. Crago, of General Electric's Aviation Division, will discuss: "Electric-Control Systems for Aircraft," at the November 19 meeting of F. W. E. C.

Mr. Crago has written a number of papers and articles on engineering subjects and is well known for his original work in the aircraft field.

After graduation from Pennsylvania State in 1918, with a B.S.E.E. degree, Mr. Crago entered the General Electric Test Course. His first permanent assignment was with the Industrial Control Engineering Division, and later, he became a member of the Air Conditioning Engineering Department.

The Industrial Control Division then claimed his services as Application Engineer. When the Aviation Industry began to expand, Mr. Crago was transferred to the Aviation Division where he has specialized in the application of motors and control to aircraft.

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### INDIANA ENGINEERING COUNCIL

The annual joint meeting of the Indiana Engineering Council and the Indiana Society of Professional Engineers was held at the Claypool Hotel in Indianapolis on Saturday afternoon and evening, October 30.

All members have received copies of the program. The afternoon talks were well received by a small but enthusiastic group. The evening banquet, addressed by Gov. Schricker, was better attended.

At the afternoon business meeting, action was obtained in the form of an authorized resolution sponsored by L. Z. Gossman and J. W. Dickens of the Fort Wayne Engineers Club opposing the Kilgore Bill. Mr. Gossman was given 15 minutes at this business session to present the views of the Fort Wayne Groups in opposition to the bill. The authorized resolution resulted.

Mr. Ralph Simpson of Indianapolis was elected President and Mr. Russell Bass of Indianapolis was elected Vice-President of the Indiana Engineering Council for the coming year.

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### WRITE YOUR SENATORS AND REPRESENTATIVES

Defeat of the Kilgore Bill, S. 702, is vital to every Engineer. Address your letters to Hon. H. M. Kilgore, E. C. Johnson, E. D. Thomas, M. C. Wallgren, J. E. Murray, R. C. Holman, Chapman Rivercomb, G. A. Wilson, Frederick Van Nuys and Raymond Wills. The address of these Senators who are members of the Senate Military Affairs Committee and the Senators from Indiana, is: Senate Office Building, Washington, D. C.

Hon. George Gillie, Representative from Indiana, may be addressed: House Office Building, Washington, D. C.

## NEVER TOO LITTLE OR TOO LATE

The title of this story is at the same time the slogan and the boast of every electric utility. For truly, electric service has never been too little or too late. In spite of the tremendous demands for service to meet the needs of war production, in spite of curtailments in expansion programs, and shortages in materials and man power, electric service has been ready when needed. All this has been accomplished with so little fanfare and publicity that few realize the magnitude of the task that has been accomplished.

We are all familiar with our magnificent record in producing materials and equipments of war; we have seen new plants spring up; almost overnight we see olden plants working around the clock. But how many fully appreciate the vital part that electric service is playing in this vast program. Due to improvements in machines, to greater use of electrical heating, to new processes such as high frequency induction heating and in increased illumination, the average worker has at his command today more electrical horse power than ever before in the history of the world. When we consider this together with the increase in the total number of workers we get some conception of the increase in the demand for electric service. Then we can understand why the total electric energy produced each week is now about twice what it was five years ago.

It is a matter of common knowledge that expansion of utility plants has been drastically curtailed. How then have the utilities been able to handle the increased load? By interconnections between systems; to permit mutual help and thus permit the operation of equipment which would otherwise be held in reserve; to obtain the benefit of diversity between systems; and to permit power to flow to areas where it is most needed. By carrying increased loads on all existing equipment and operating for longer periods, and by rigid programs of inspection and maintenance. In a word, by co-operation plus engineering.

So successful have these efforts been that here is at the present time no shortage of generating capacity. There is plenty of electricity for all essential needs. The Government's Conservation Program, recently announced, is necessary to save critical supplies and essential services but it is not an indication that the utilities have failed to do their job.

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New WAC: "Where do I eat?"  
 Captain: "You mess with the officers."  
 New WAC: "I know, but where do I eat?"

V

"Was Jane in a red frock at the party?"  
 "Some of her, darling, some of her."

## THE ELECTRIC CONSERVATION PROGRAM

The electric conservation program is a part of a voluntary, government-sponsored, program designed to conserve manpower, transportation, fuel, and critical materials through savings in electricity, gas, oil, coal, water, communications, and transportation.

Electricity, as such, cannot be saved since it is used as soon as it is made, but conservation in its use will effect saving in the fuel which is burned to generate it; in the transportation used to move the coal from the mines to the power plants; in the manpower required to mine and transport the coal; and in the critical materials used in lamp bulbs and electrical equipment. It is estimated that a ten per cent reduction in domestic and commercial uses of electricity would save annually 2,880,000 tons of coal; 1,000,000,000 ton miles of transportation; 1,000,000 barrels of oil; 9,500,000,000 cubic feet of natural gas and 75,000,000 lamp bulbs.

All users of electric service are being asked to co-operate in this program. Residential users are asked to turn off lamps and appliances when not in use and in general to eliminate all waste and non-essential uses. Commercial users are requested to curtail the use of signs and window lighting, and to eliminate decorative lighting and daytime burning of outdoor lighting. Industrial users are asked to make any savings which will not hamper production.

Whole-hearted co-operation in this program by all will help hasten the day of victory.  
*A Darker Tonight Means a Brighter Tomorrow!*

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## AN ENGINEER—(As defined by an Auditor.)

The typical engineer is a large, full-blooded enthusiast, a cigar smoker, with hair on his chest and a Y.M.C.A. secretary's smile. He talks in astronomical figures, and abhors detail. His limits of accuracy are plus and minus \$5000, and he brags if he stays within these limits. He is the despair of auditors, only exceeded in this respect by social workers. Happily, he is a mule without pride of ancestry or hope of posterity and goes to an early grave, cheerily waving a slip stick, mourned by none and remembered only by his creditors.

## AN AUDITOR—(As defined by an Engineer)

The typical auditor is a man past middle age, spare, wrinkled, intelligent, cold, passive, non-committal, with eyes like a codfish, polite in contact, but at the same time unresponsive, calm and damnable, composed as a concrete post or a plaster-of-paris cast; a human petrification with a heart of feldspar and without charm or the friendly germs, minus bowels, passion, or a sense of humor. Happily, they never reproduce and all of them finally go to Hell.

(Lifted from *Motor Notes*)

## THE ELECTRON MICROSCOPE

Man has striven to increase the resolving power of the microscope ever since it received its first real impetus by Leeuwenhoek in the latter part of the seventeenth century. Leeuwenhoek made it possible to see, for the first time, minute organisms that were heretofore never even suspected. Men of science, being creatures difficult to satisfy, wanted to explore even deeper into the secrets that were now partially exposed. To this end they worked until the limit of useful magnification was reached—about 2,000 diameters. This limit is imposed by the wavelength of light. Any dimension shorter than the wavelength of light, which is of the order of 1/200,000th of an inch, cannot be magnified without blurring. If greater magnifications were to be attained, a new transmitting medium had to be found.

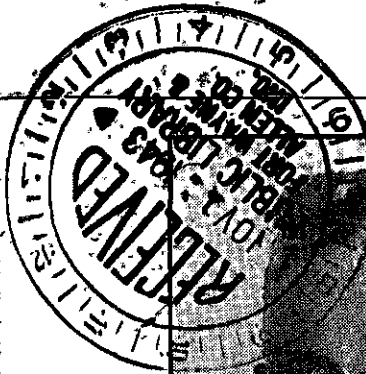
The fundamental idea of the electron microscope was discovered by Louis de Broglie, a French physicist, when he noticed the similarity between light rays and a stream of electrons. The optical microscope and the electron microscope are very similar, indeed. In the electron microscope, visible light is replaced by a stream of electrons traveling at a velocity of the order of 90,000 miles per second. Electrons at this velocity have a wavelength of about 1/100,000th of the wavelength of visible light. The electron microscope, like the optical microscope, has an objective, projection, and condenser lens which performs the same functions as the corresponding parts in the optical microscope. The lenses, however, instead of being of glass, may be either electric or magnetic fields. The electrons, after being emitted from the cathode, pass through the condenser lens which causes them to converge upon the specimen. The objective lens then forms the initial image which has a magnification of about 100 diameters. The projection lens then magnifies this image about 250 times, producing to total magnification of about 25,000. The image can be viewed directly if the electrons are allowed to strike a fluorescent screen, or it may be photographed if the electrons are allowed to strike a photographic plate. A photographic enlargement can then be made so that the useful magnification may be as high as 100,000 diameters.

Although the electron microscope has only been a commercial reality for a few years, many new fields have been opened. It has enabled man to see the structural form of germs and to observe germs as different chemicals react upon them. In fact, some of the larger organic molecules have been detected.

V

R. G. KIRACOFÉ

R. G. Kiracofe, of Tokheim, died on Tuesday, November 2, 1943.



This is Mr. C. E. Carlson.

Mr. Carlson is Treasurer of F. W. E. C.

He is unhappy.

F.W.E.C. members are not paying their dues

The *Engineers News* has not been giving Mr Carlson and his problems enough publicity.

He can't be blamed for being unhappy.

As long as Mr. Carlson is unhappy his picture will appear in the *News*.

Mr. Carlson will accept payment of dues at the Chamber of Commerce on November 19. The dues are \$3.00 for regular and associate members and \$1.00 for non-resident members.

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### NEW MEMBERS

#### Active

Arthur N. Begvar, Gov't. Insp., Winter St.  
 Ralph E. Bilings, G. E. Co.  
 Orval A. Doherty, G. E. Co.  
 Samuel E. Gilmore, Wayne Pump Co.  
 Vern L. Gingham, G. E. Co.  
 Gerald G. Grosh, G. E. Co.  
 George E. Hoopingarner, G. E. Co.  
 Robert F. Johnson, G. E. Co.  
 Carl A. McKay, G. E. Co.  
 Harold F. Staley, G. E. Co.  
 Burney P. Tomson, G. E. Co.  
 Roman C. Warncke, G. E. Co.

#### Associates: —

William R. Hunt, G. E. Co.  
 R. Donald Sinish, G. E. Co.