

ENGINEERING

# Test Giant Circuit Breakers On "Live" Power System

## Electrical Engineers Hear That Graduates in This Profession May Expect Good Salaries, Quick Promotion

See Front Cover

**E**LECTRICAL engineers have "pulled" a short circuit to end all short circuits, it was reported to the American Institute of Electrical Engineers, meeting in Washington, D. C.

In a test on oil-filled circuit breakers, described by Philip Sporn and H. P. St. Clair of the American Gas and Electric Service Corporation, New York City, the flashing arc drew 2,000,000 kilovolt amperes.

This arc, assuming that it could continue without burning up all the electrical wires of the land, would be sufficient to supply the peak power demands of about 3,000,000 people; comparable perhaps to Chicago.

This tremendous arc, however, was quenched harmlessly in the oil circuit breakers and the current restored within four cycles of the alternating current; within six hundredths of a second.

Technically the reactance of the circuit is the 2,000,000 kilovolt ampere figure cited by the engineers. This reactance is 90 degrees out of phase with useful current of the circuit. However, the current which did pass in the arc—if it had been in the proper phase—would have been sufficient to supply, for an instant, a city the size of Chicago.

The cover of SCIENCE NEWS LETTER this week shows how giant oil circuit breakers are tested in electrical shops before being placed in service. By adjusting the space between the large

spheres, engineers are able to regulate as many as 750,000 volts from a transformer before they are applied to test the circuit breaker.

### A Good Profession

This year's crop of high school graduates looking forward to college, and the course they will take there, might look twice at salaries of the engineering profession reported by Prof. R. W. Sorensen, California Institute of Technology.

Graduates of a four-year engineering course start low—at perhaps \$25 or \$30 a week—but most of them quickly are promoted to more lucrative jobs.

Some of them, in the highest 10 per cent. will eventually reach an average salary peak of between \$12,000 and \$13,000 a year. For a quarter of them this peak will be about \$7,500 yearly and half of them will reach the \$5,000 a year class.

Moreover, the earning period (with ever-increasing salary) is very long for engineers. The peak salary is not reached until about the 60th year, or 37 years after graduation. Lawyers and doctors, Prof. Sorensen said, seem to follow a comparable earning curve. During the depression less than 3 per cent. of the various engineers in the country were unemployed.

Finally, engineering is a profession in which many students work their way through college, Prof. Sorensen pointed out. He cited one college where about a sixth of the students came from families having incomes of only \$1,200 a year or less and who were receiving help from the National Youth Administration.

Graduates of engineering colleges do not fail to reach expected goals because of lack of technical training, said Prof. Sorensen, but because some of them lack other qualities which include: personality, loyalty, patience, breadth of interest, business ability, leadership, aptitude, promptness, accuracy, judgment, executive ability and a proper estimate of their own value.

*Science News Letter, July 9, 1938*

## ● Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.

GEOLOGY

## Geologists Are To Study "First Texans"

**S**TIRRED by discoveries of remains of early man and of animal bones near Alpine in the rugged Big Bend country of southwestern Texas, geologists this summer will study the Pleistocene, or Ice Age, deposits of that region, it is announced by the Geological Society of America.

In 19 locations already found, tools left by these "first Texans" have been found from seven to 20 feet below the surface. The investigators, Drs. Kirk Bryan, professor of geology in Harvard University, and Dr. Claude C. Albritton, instructor in geology at Southern Methodist University, have just been awarded a grant from the Penrose bequest of the society to carry on the research.

*Science News Letter, June 25, 1938*

## SOILLESS Growth of Plants

by Carleton Ellis and Miller W. Swaney

**T**HE first complete treatise in book form on this immensely important subject which discusses thoroughly all three methods of Soilless Growth—Water Culture, Sand Culture and Sub-irrigation.

Interesting, timely, and instructive both to scientists and laymen is this new comprehensive book on the art of growing plants without soil. Probably no technical development of the past decade has made a more triumphant entrance into the realm of lay science than has the soilless growth of plants. So important is this new development in plant growth that the National Resources Committee selected it as one of the few recent technical advancements likely to help fashion the future of this country. So fascinating is this method of growing flowers, vegetables and fruits, that the desire to try out this "new way" is spreading with phenomenal speed.

Table of Contents: Chemistry of Plant Life; Growing in Mineral Aggregates; Sand-Culture Method; Sub-irrigation Method; Growing in Water; Water-culture System; Nutrient Solutions; Household Plant Culture; Growing Flowers for the Family; Growing Vegetables for the Family; Commercial Aspects; Special Chemicals; Plant Hormones; Doubling Chromosomes in Plants; Effects of Miscellaneous Chemicals on Plants; Common Detriments; Nutrient Formulas; Index.

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## ● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenters:

Thursday, June 23, 7:54.4 a. m., E. S. T.  
Region of the New Hebrides Islands, 1100 miles northeast of Brisbane, Australia. Latitude 20 degrees south, longitude 169 degrees east.

Saturday, June 25, 6:45.1 p. m., E. S. T.  
Arctic Ocean north of Scandinavian peninsula. Latitude 77 degrees north, longitude 14 degrees east.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL May 21.