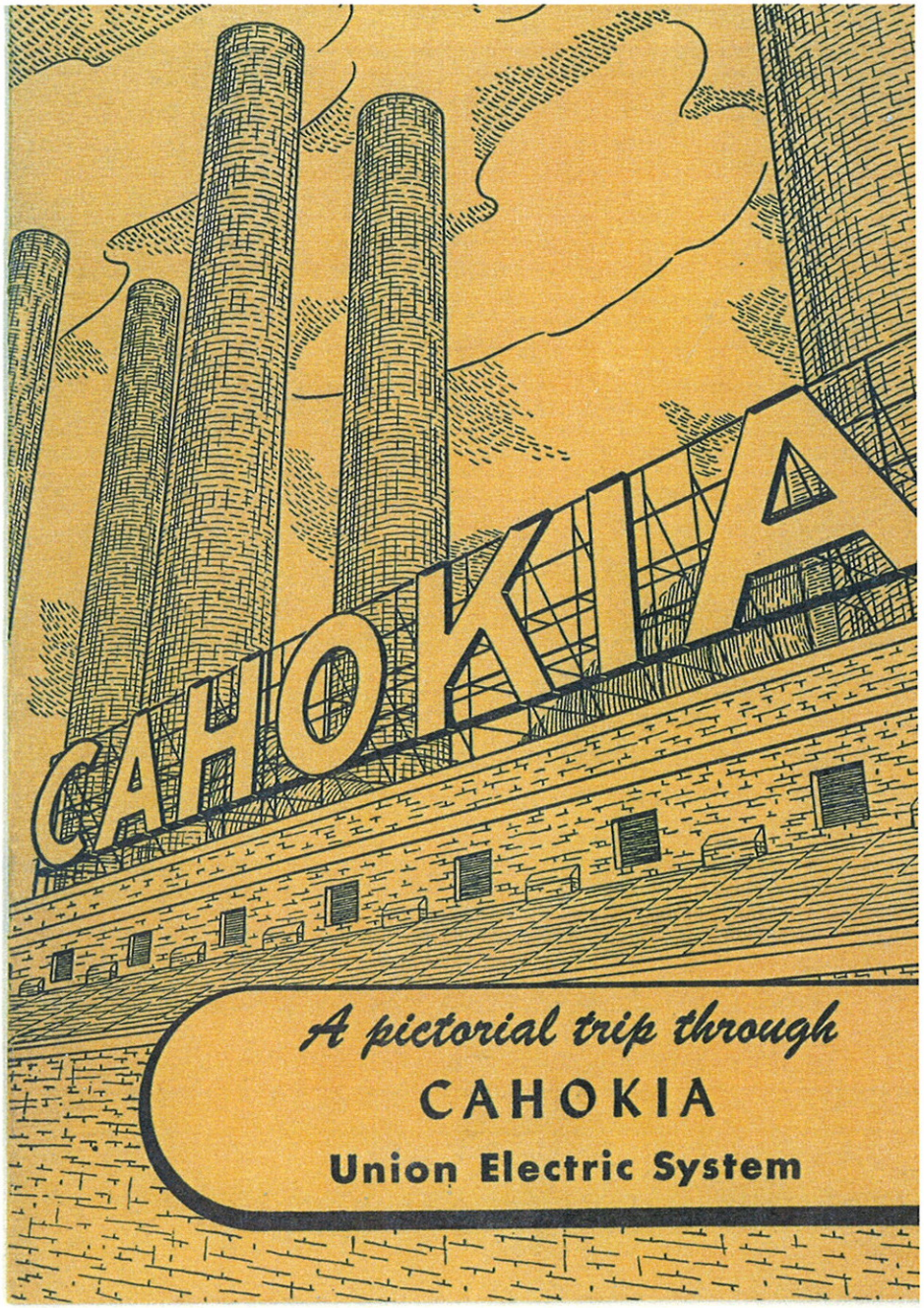
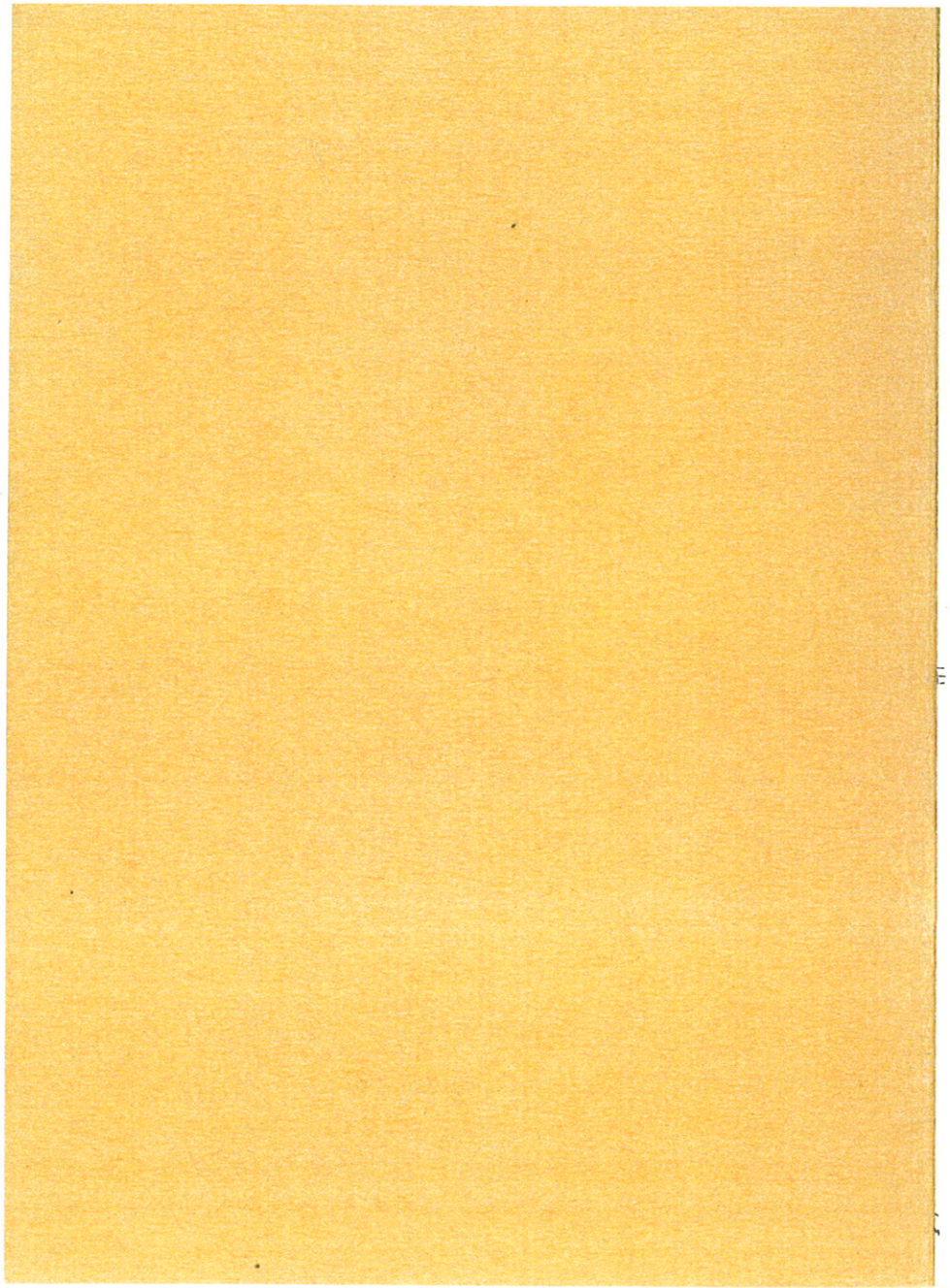

CAHOKIA
A pictorial trip through
CAHOKIA
Union Electric System



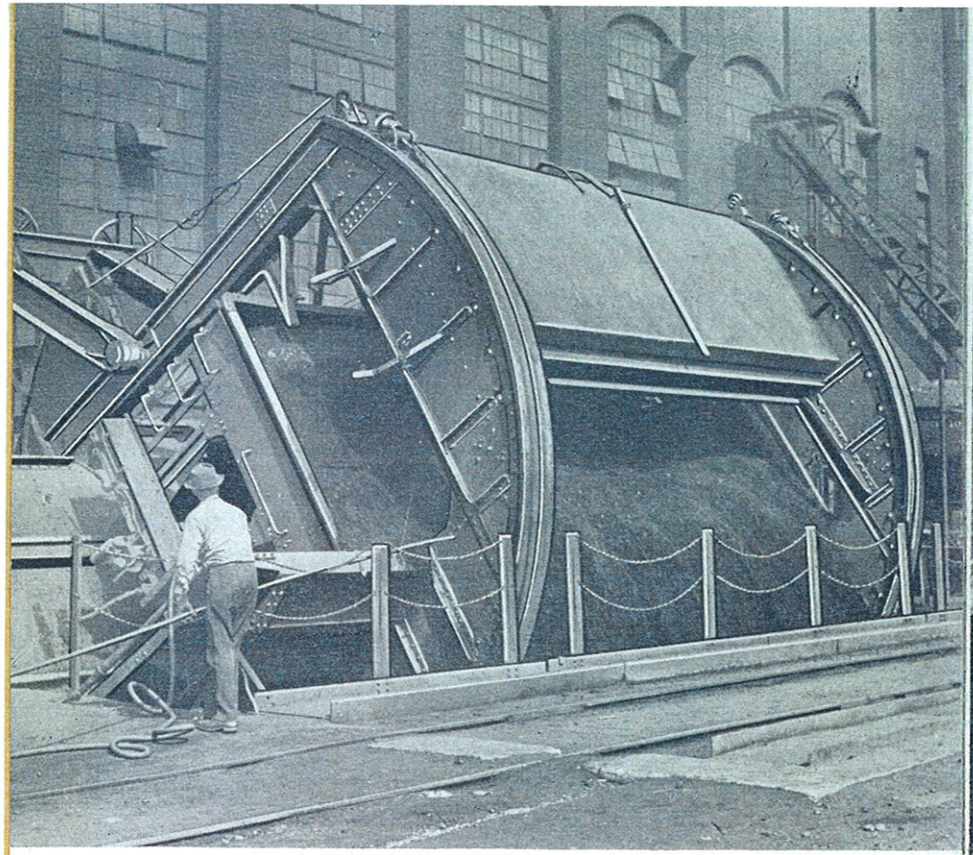
CAHOKIA

Cahokia is the largest power development in the Mississippi Valley, having a capacity of 300,000 Kilowatts or 400,000 horsepower, and has produced annually an average of one billion kilowatt hours. Standing majestically on the Illinois shore of the Mississippi River, its six great stacks with an internal diameter at the top of 21 feet reach skyward 350 feet above the lowest portions of its furnaces. Four railroads bring coal to its 52-acre site. Four hundred and fifty men are employed within its walls. Its six turbo-generators are capable of lighting three million 100-watt bulbs at once.

Cahokia is one of five major steam generating plants which, teamed with the two hydro-electric projects at Bagnell, Missouri, and Keokuk, Iowa, comprises Union Electric's system of power generation. This well-balanced system serves greater St. Louis and 150 other communities, as well as an extensive rural area. In contrast with the variability of water power, steam power plants carry their full capacity for longer periods of time. By combining steam and water generation, Union Electric is able to maintain efficient operation at the most economical level.

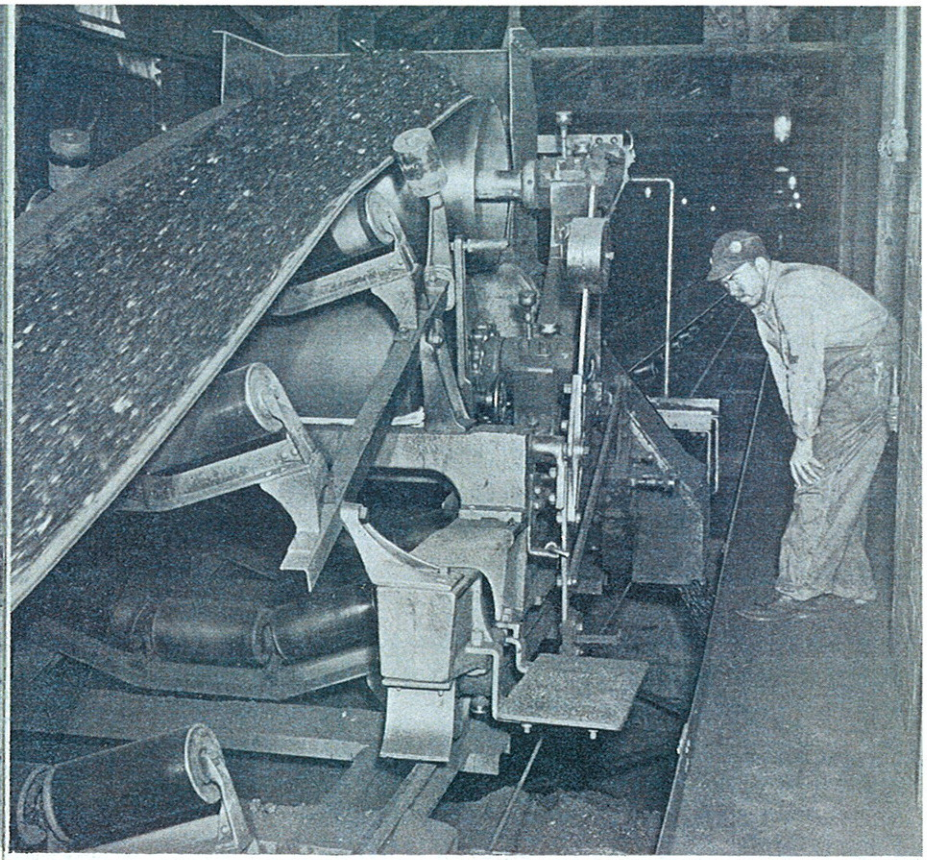
The plant was built in sections, the first being completed in 1923 and the third in 1938. It was one of the early central power stations designed for the exclusive use of coal in pulverized form. The overall structure rests on reinforced concrete piles driven to a hard gravel strata 40 feet below zero river stage.

UNION ELECTRIC COMPANY OF MISSOURI



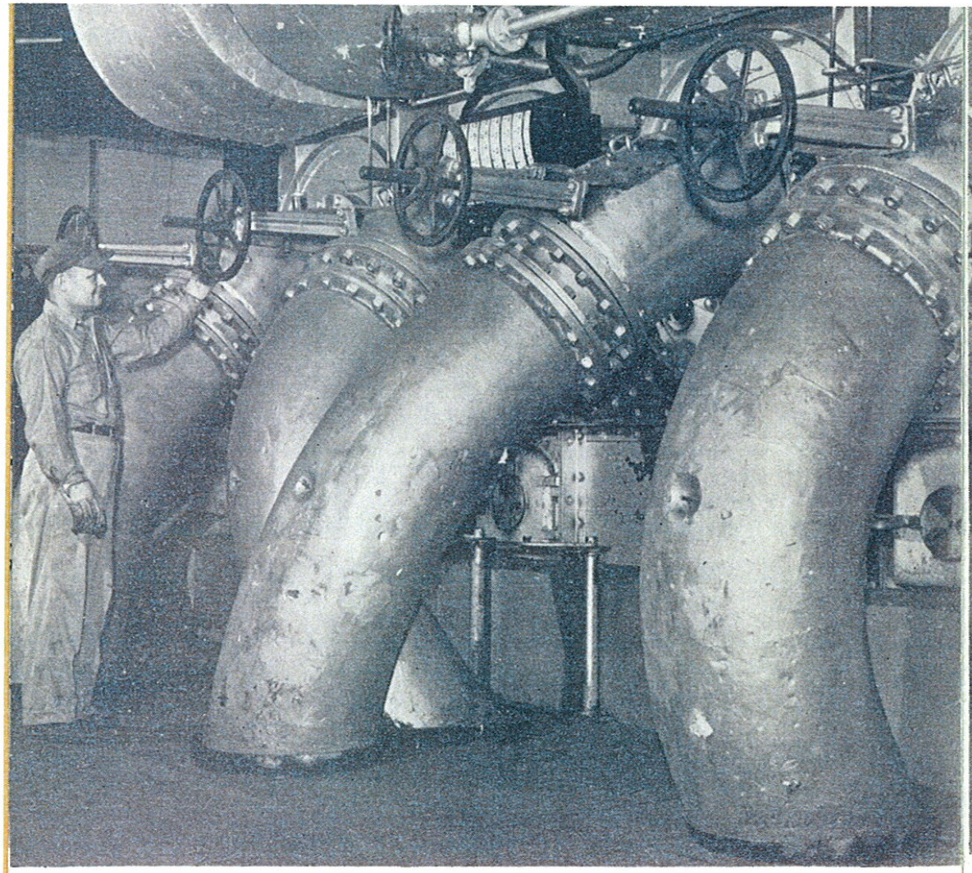
COAL CAR DUMPER

Cahokia consumes a normal maximum of 85 car loads of coal a day. Coal is unloaded by means of a dumper which clamps onto the car and turns it over, dumping the coal into an underground hopper which feeds conveyor belts running into the plant or out to the storage yard. Principal source of coal is Kathleen No. 2 mine in southern Illinois.



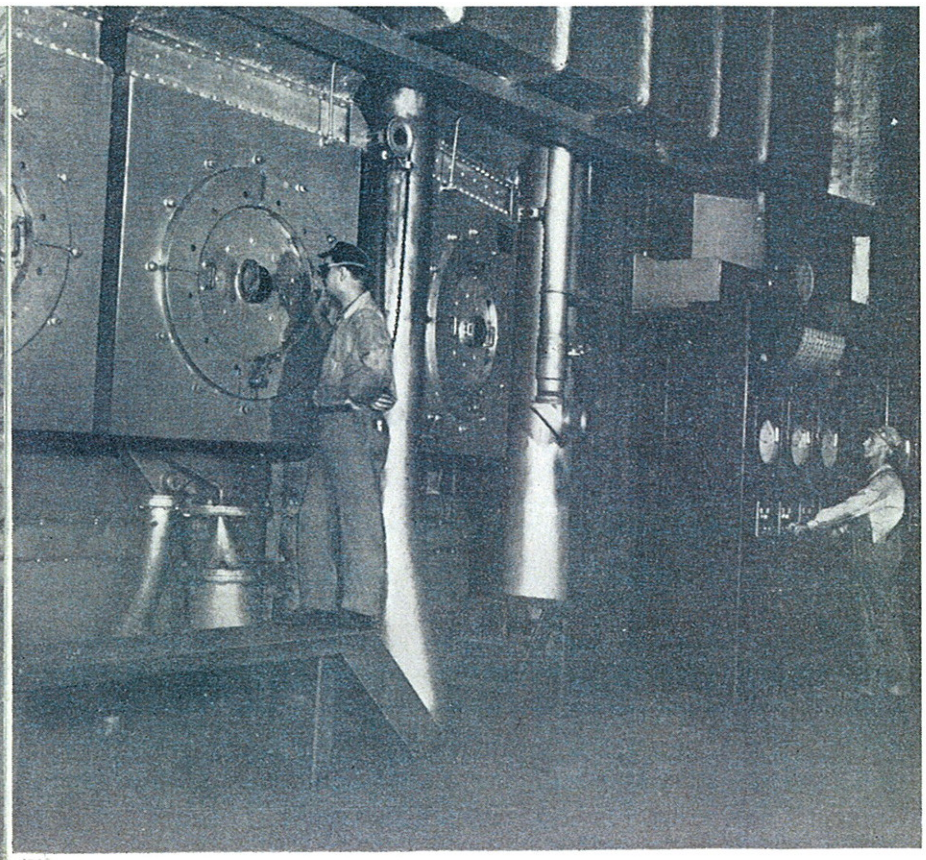
CONVEYOR BELT TRANSPORTATION

Conveyor buckets carry coal to top of plant where it passes by means of a conveyor belt over a magnet. This sorts out bits of foreign metal. Coal then spills into bunkers from which it is fed into pulverizing mills where it is ground to the fine consistency of flour. Sealed bunkers prevent the escape of coal dust.



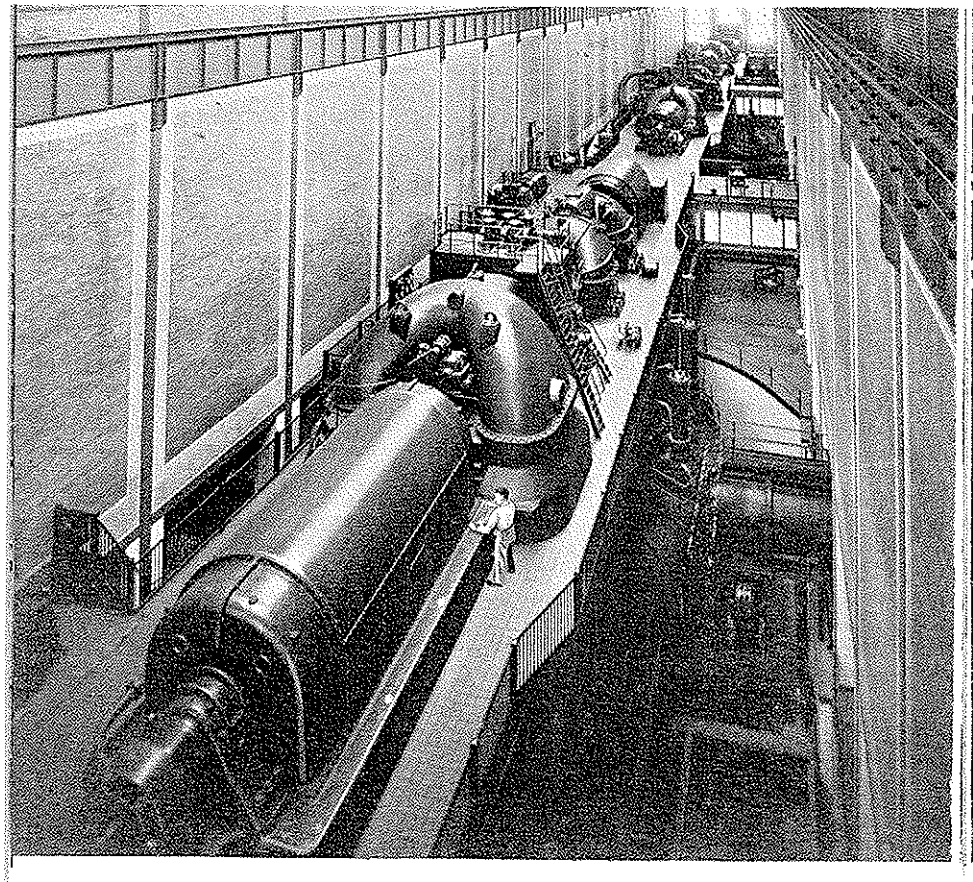
THROUGH PIPES TO FURNACE

Powdered coal is blown through giant pipes into the furnaces where it burns in mid-air like a tiny sun. This method of combustion gets the maximum heat out of the coal by assuring the consumption of every particle of inflammable material. Approximately 150 cubic feet of air is needed to burn a pound of powdered coal.



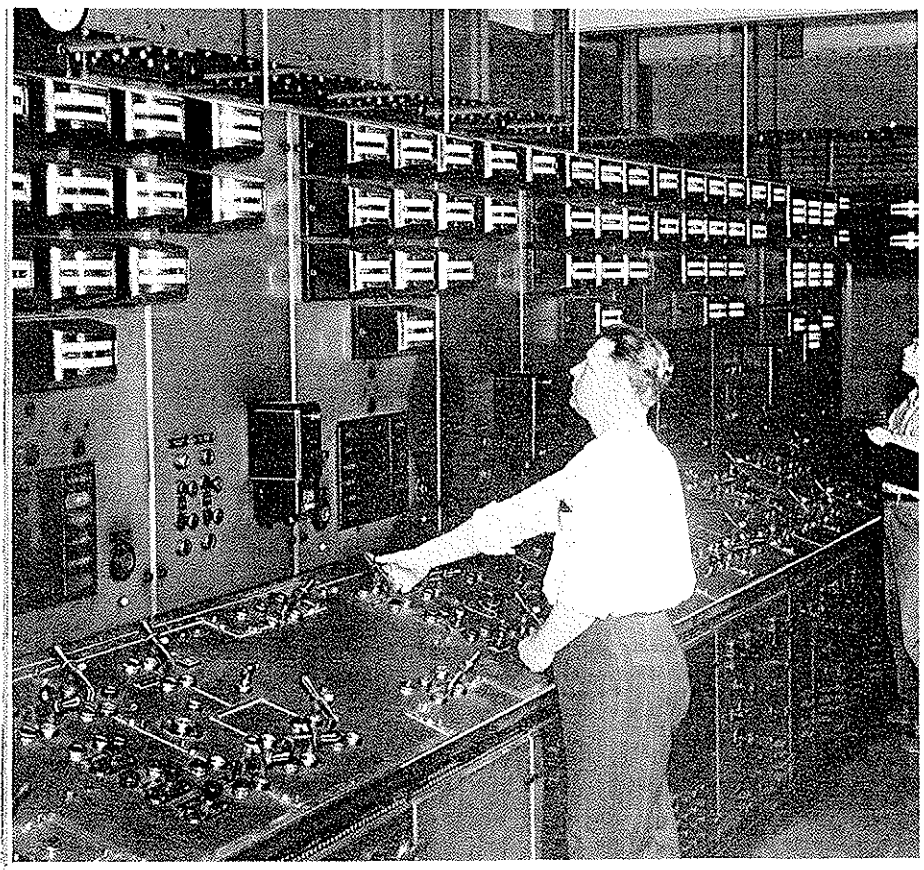
OUTSIDE A BOILER LOOKING IN

Boilers equal a seven story building in height and require careful adjustment. The workman on left checks the effect of the coal feed adjustment which the workman at right makes at the boiler control panel. Dark goggles must be worn to protect eyes from the glare. Cahokia has 24 boilers, producing 3,450,000 pounds of steam an hour.



ELECTRICITY IS CREATED

Turbo-generators spin at the rate of 30 revolutions per second. In spite of their size they have the precision of a fine watch. Each is built on pedestals detached from the rest of the building so that a minimum of vibration is transmitted to the rest of the plant. Each is well balanced on its shaft and the result is amazingly smooth operation.

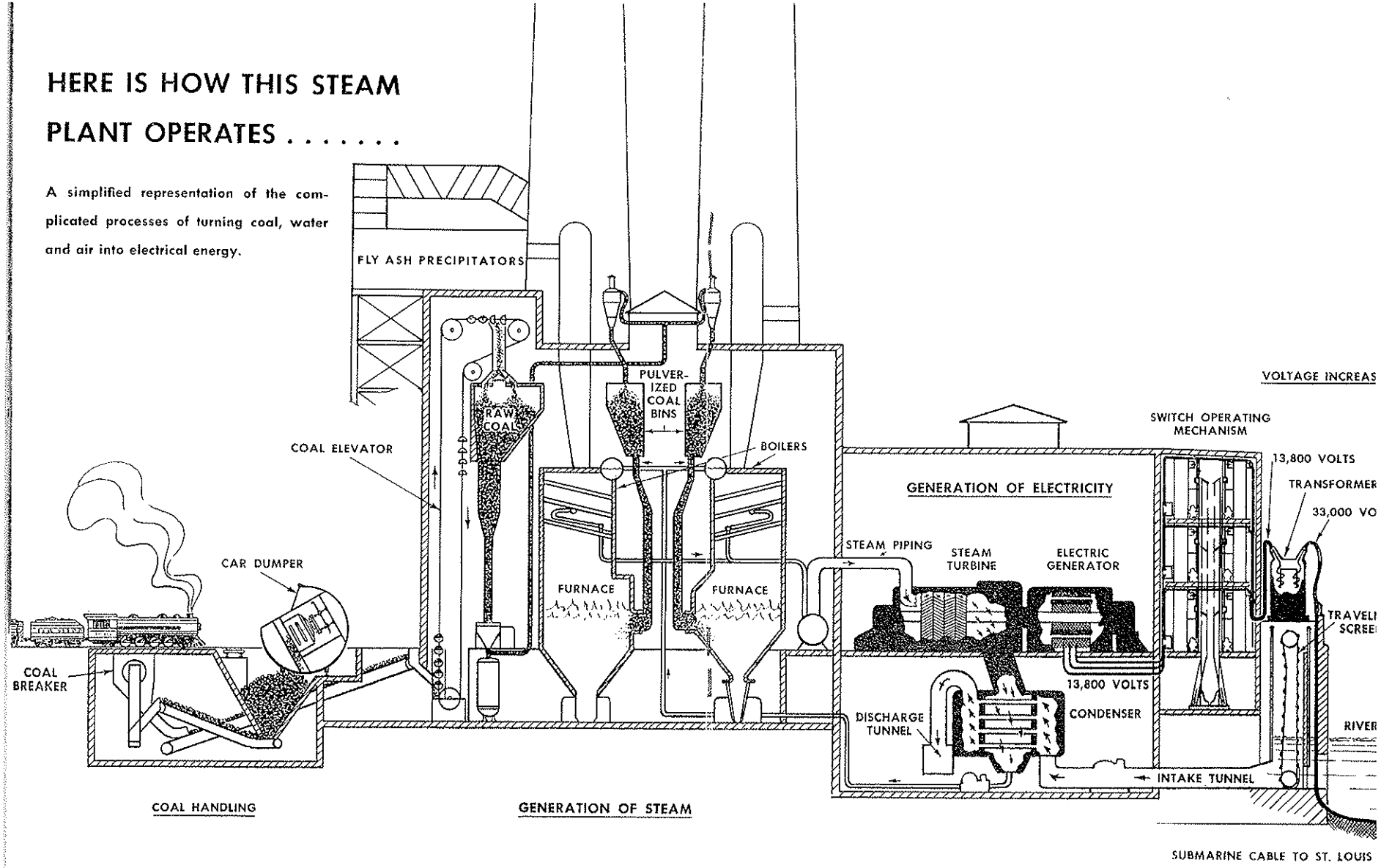


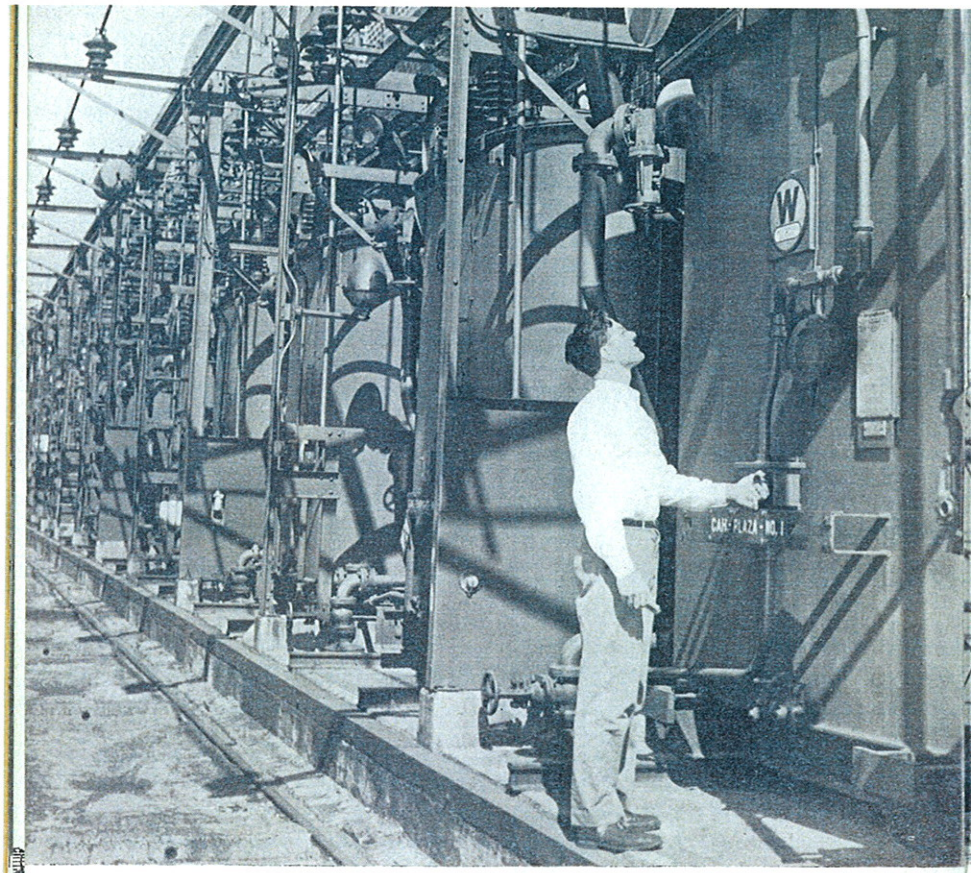
REINS ON THE GENERATORS

Operation of the turbo-generators is controlled at this switchboard. Electricity coming out of the generators is pooled with the production from other Union Electric plants and routed to your home or job. The meters shown above record the amount of electricity being generated. Control switches govern the flow of power.

HERE IS HOW THIS STEAM PLANT OPERATES . . . . . .

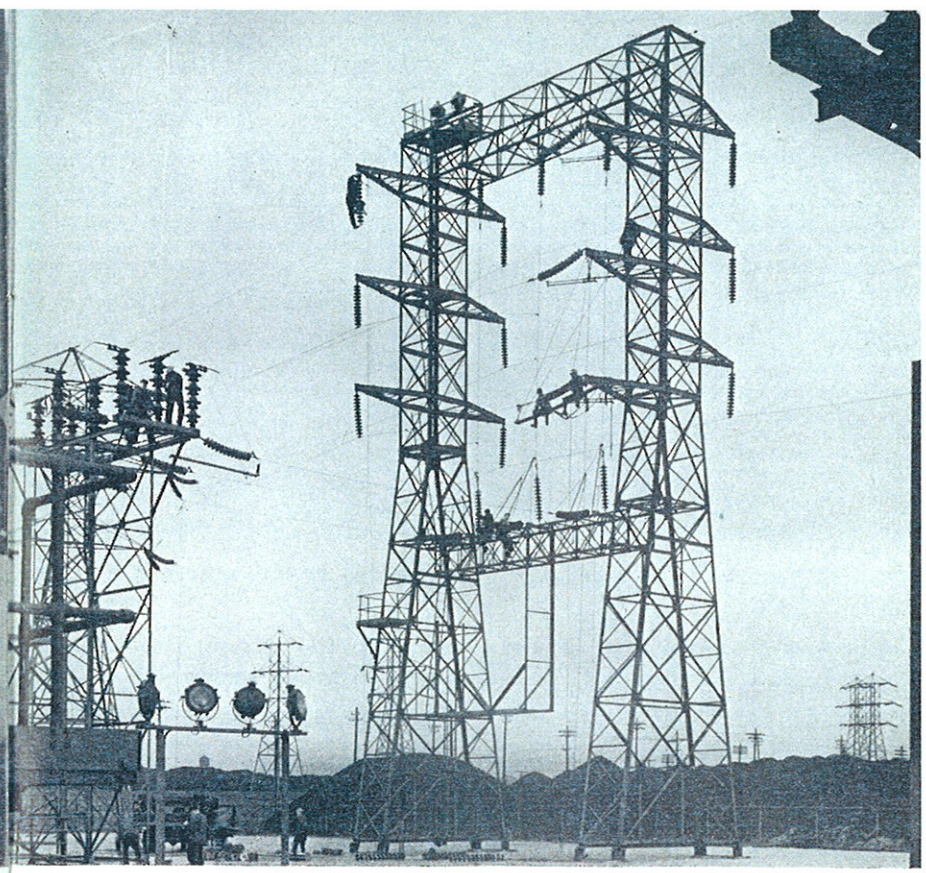
A simplified representation of the complicated processes of turning coal, water and air into electrical energy.





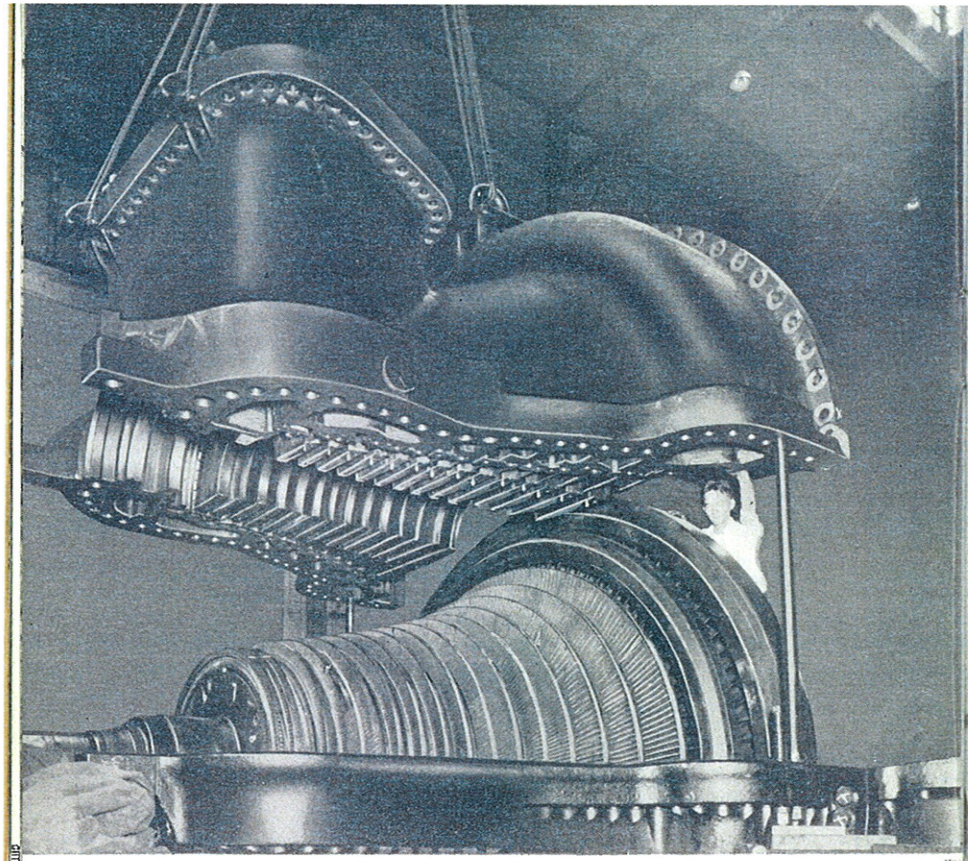
WHERE VOLTAGE IS INCREASED

This row of 29 transformers on the river bay step up the voltage of the energy being sent from Cahokia through the submarine cables across the Mississippi river bottom to St. Louis. Thirty-four cables are in operation and sixty have been laid since Cahokia was built. They last approximately thirty years; require little maintenance.



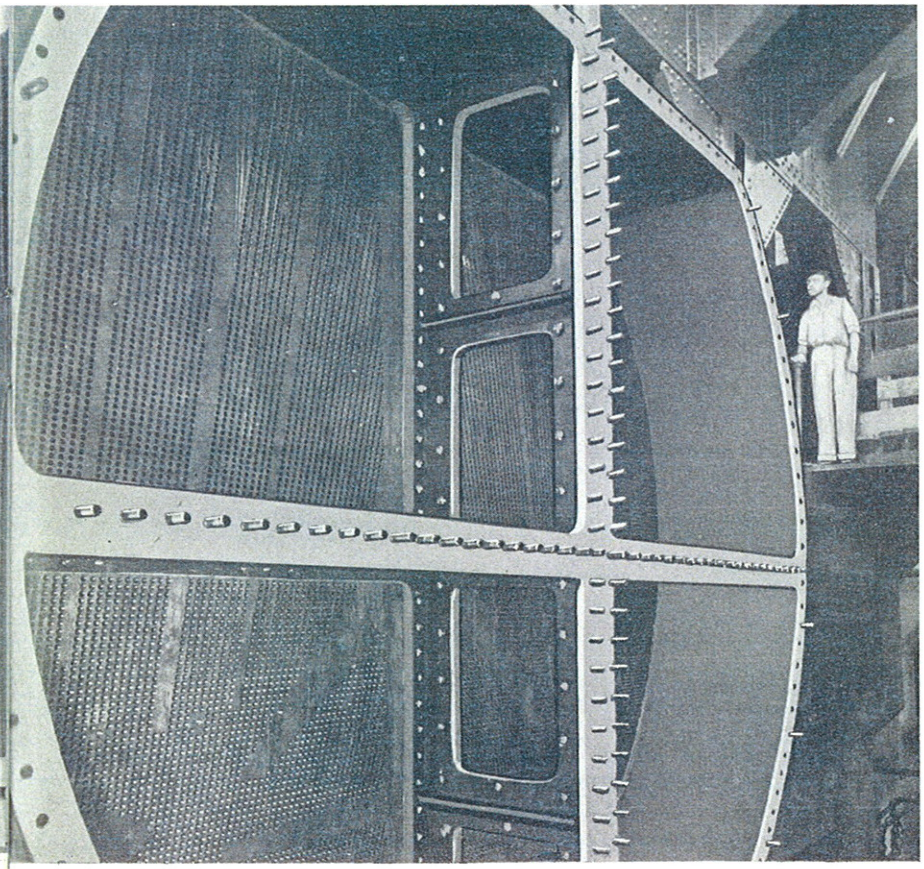
OFF TO THE CONSUMER

Transmission lines leaving Cahokia carry electricity at high voltage over long distances to substations where transformers reduce the voltage. Switches rout it over electric lines strung on poles or in underground cable to customers. The uppermost wire along the transmission towers carries no current, serves as a lightning rod.



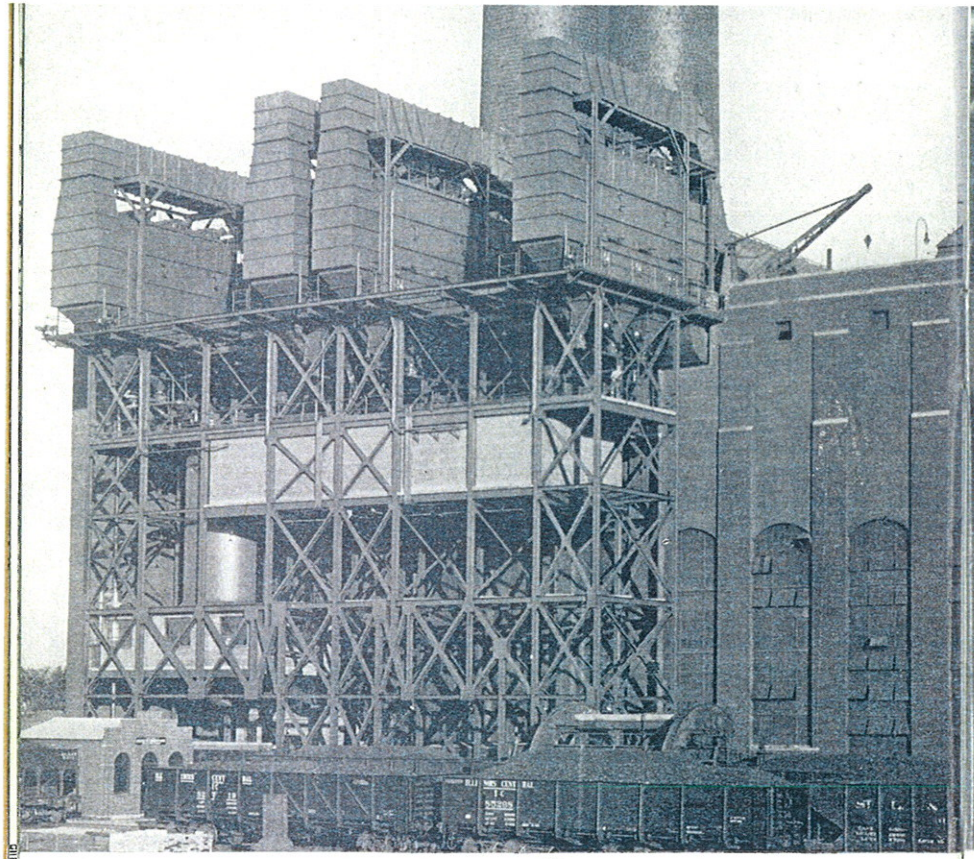
WHEN REPAIRS ARE MADE

The inside of a steam turbine looks like a spinning top on its side. Steam blows in from the top (left) of the hoisted casing, and moves through the rows of vanes to be sucked out the bottom (right). The steel rod (right) is one of several used to guide the upper casing back in place so as not to damage vanes after repairs are completed.



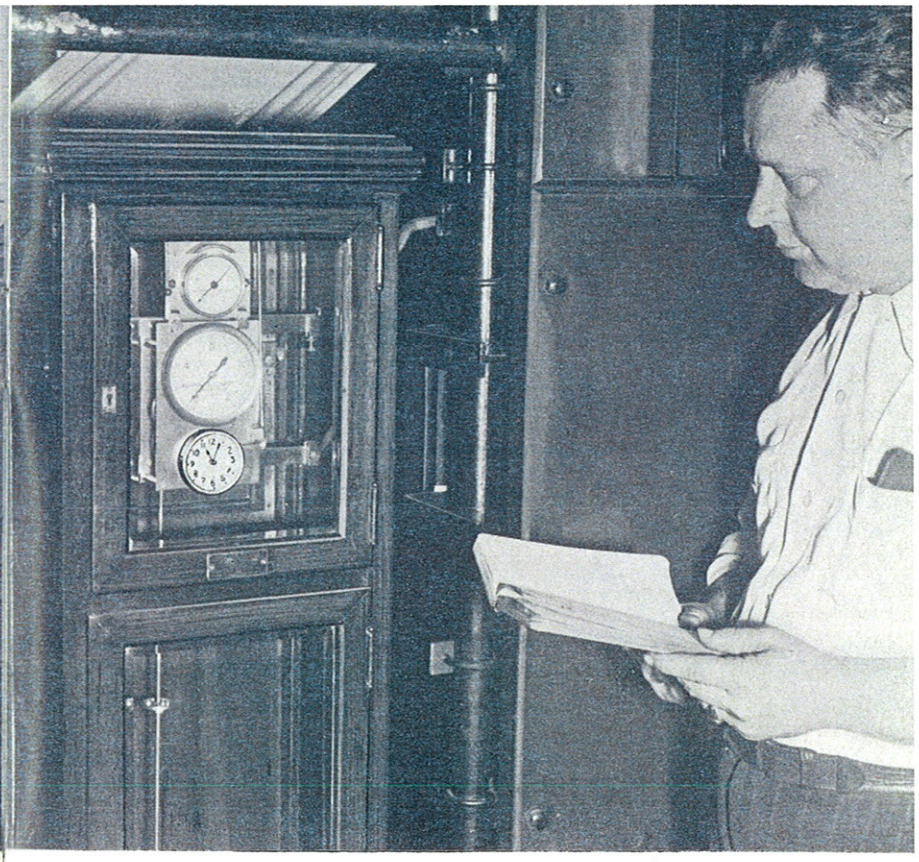
OCEANS OF WATER

Men are small beside one of Cahokia's six condensers. Here the end plating is off the condenser, exposing the ends of the more than 50 miles of tube through which river water runs to condense the steam from the turbine. Cahokia's condensers use 450 million gallons of water a day; three times the amount used by the city of Saint Louis.



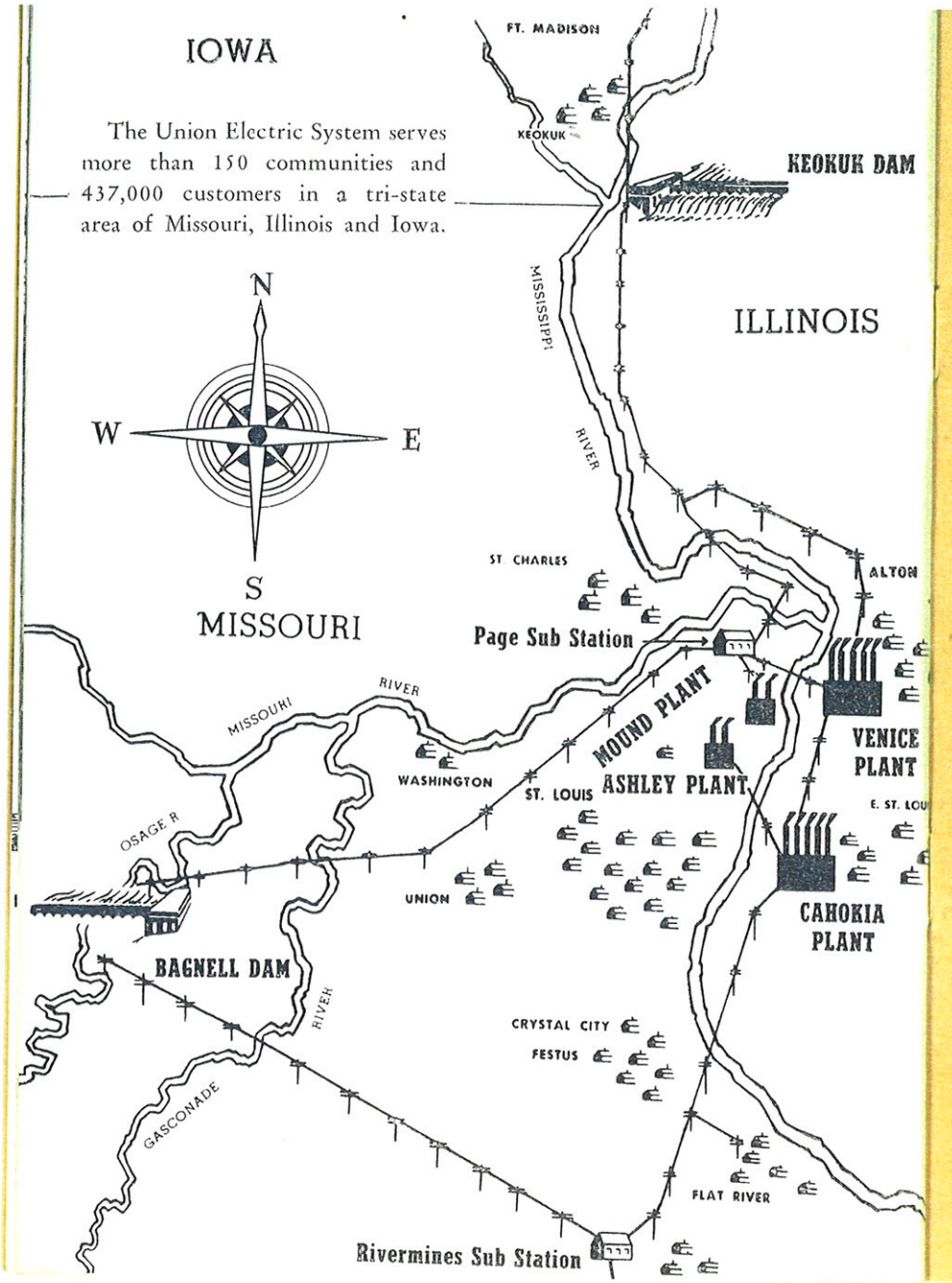
WAR AGAINST FLY ASH

Powdered coal when burned leaves an infinitesimal residue known as fly ash. Cottrell electrostatic precipitators collect fly ash, as Union Electric's contribution toward a cleaner city. Initial installation, serving one stack, required a steel support nine stories high. The equipment for all stacks will cost about two and a half million dollars.



TO PASS THE TIME ALONG

Every electric clock in Union Electric's area depends on this tiny clock in the control room at Cahokia. Technically, it is a frequency meter to maintain the turbines at the standard 60-cycles. Three times daily it is checked against the Naval Observatory master clock at Arlington, Virginia. Each hour it is checked against Western Union Time.


IOWA
The Union Electric System serves more than 150 communities and 437,000 customers in a tri-state area of Missouri, Illinois and Iowa.
N
W
E
S
MISSOURI
FT. MADISON
KEOKUK
KEOKUK DAM
MISSISSIPPI
RIVER
ILLINOIS
ST. CHARLES
ALTON
Page Sub Station
MISSOURI
RIVER
MOUND PLANT
VENICE PLANT
WASHINGTON
ST. LOUIS
ASHLEY PLANT
E. ST. LOU
OSAGE R
UNION
CAHOKIA PLANT
BAGNELL DAM
RIVER
CRYSTAL CITY
FESTUS
GASCONADE
FLAT RIVER
Rivermines Sub Station