go for meeting new burners installed in the latter half of last year's heating season.

As a suggestion for meeting the situation the author advances these points: (1) directing oil burner engineering and research to produce units more efficient in releasing available heat (2) directing most advertising and sales efforts to replacement of old and obsolete burners already in service (3) inspecting former installations during the summer months and making sure they are in good operating shape (4) continuing to increase your customer's storage facilities. *OHI Paper.*

Furnace Design Methods, With or Without Waterwalls, *by Ollison Craig, Riley Stoker Corp.* A furnace is an enclosure in which heat is produced by burning fuel. The enclosure discussed is one applied to a boiler or steam-generating unit. With this very general background the author proceeds to discuss the types of furnace walls, their position with respect to the furnace, their nature as the fuel-burning method requires it, and their design function. In addition, tables are worked up for furnace dimensions for various fuel-burning methods. This paper will be presented in article form by POWER in an early issue. *MPC Paper.*

A New Appraisal of the Fuel Situation, *by John Van Brunt, Combustion Engineering Co.* Of the 225 billion kwhr generated in 1947 by electric utilities, about 30% were generated by hydro, 16.5% by oil and gas, 53.5% by coal.

There are many discussions on coal *reserves available; in Table I an* estimate made in 1943 is reproduced. Table II shows the amounts of coal consumed by various industries.

Quality of coal over the years has fallen off and the guess is it will *continue to deteriorate. But in view of the demands for oil and petroleum products* it appears that coal and steam will *furnish an increasing proportion of* primary energy for electric power production. *MPC Paper.*

PANEL HEATING

A Simplified Panel Heating Design Procedure, *By B F Raber, and F W Hutchinson, University of California.* A great majority of panel-heating installations are in residences or other structures which depend on infiltration for outside air. Ventilation rate runs usually between one-half and one and one-half air changes per hr. The common relatively effective installation method arbitrarily uses a fixed fraction —often 100%—of ceiling, floor or walls as heating surface. On such a basis panel design reduces to determining (1) the load on each sq ft of panel (2) required water temperature (3) lineal feet of pipe or tube needed.

To reduce panel-heating design a simplified step-by-step procedure has been developed. It is derived from a heat balance design method growing out of a joint research project of the American Society of Heating and Ventilating Engineers and the University of California. Four tables and a graph serve as the information sources for developing the step-by-step conclusion. *MPC Paper.*

HOW TO OBTAIN COMPLETE TEXT

Material appearing in this month's briefs comes from one of these two sources:

Midwest Power Conference, Tenth annual meeting, Chicago, April 7-9, 1948. Papers are identified by initials *MPC*. Available about August 1 in Volume X, Proceedings of Midwest Power Conference, 1948, $3, through Stanton E Winston, Conference Director, Illinois Institute of Technology, 3300 Federal St, Chicago 16.

Oil Heat Institute of America, Inc, New York, N. Y. Annual meeting, Chicago. April 5-8, 1948. Papers are identified by initials *OHI*. Only copies are ones made available to those in attendance at the annual meeting.

WATER TREATMENT

Evaporative Condensers, Their Use and Application in Water-Shortage Areas, *by Ross J Martin, University of Illinois.* Many communities find present water systems inadequate mostly because (1) purification and distribution are not ample (2) sanitary and sewage-disposal systems are too small (3) source of water falls short of demand.

Water source for domestic and industrial use is usually from the surface, for instance, from lakes and rivers, or wells drawing water from beneath the ground. Too heavy a rate of draw from wells may result in exceeding the rate of recharge from seepage or underground streams. Riverside in the Chicago area is a case in mind. In 1900 the level of wells stood at 29 ft beneath the ground surface (590 ft above sea level). By 1940 this same well field had dropped to 324 ft below the ground, or 295 ft above sea level. In the same year, industrial pumpage from wells in the Chicago area that helped to pull down the level of this field had reached 14.5 million gallons a day.

Air-conditioning water needs, plus in-

(*Continued on page 142*)

I: 1943 ESTIMATE OF COAL RESERVES, BILLIONS OF TONS

	Anthracite	Bituminous	Sub Bituminous	Lignite	Equivalent Bituminous of 13,000 Btu
Eastern province	15.1	585.7	—	—	624.1
Interior province	.2	457.1	—	22.9	487.5
Northern great plains	.1	363.9	818.2	915.5	1447.5
Total reserves	15.4	1406.7	818.2	938.4	2559.1

II: COAL CONSUMED BY VARIOUS INDUSTRIES, 1947*

	Coal used in 1947, tons	Increase over 1946, %
Electric utilities	86,000,000	25.1
Coke byproduct	94,522,000	24.2
Coke beehive	10,142,000	41.5
Steel mills	10,048,000	12.3
Other industries	126,706,000	6.8
Railroad, Class 1	109,296,000	—.8
Retail & export	167,918,000	10.4
Bunker fuel, miscellaneous	4,178,000	25.0
	616,685,000	13.9%

* Report of the Bituminous Coal Institute, February 25, 1948