Porter, Ovitz[1] and others (1910) have been engaged for some years on the study of the constitution and decomposition of coal. Their results, which have in the main appeared in publications of the U.S. Bureau of Mines, are of very great value and numerous quotations and abstracts from their work will be found in the following pages.

A distinction should be noted between H. C. Porter whose work is here referred to and J. B. Porter, the senior author of the present volume.

Parr and Kressmann[2] (1910) experimented on bituminous coals from Illinois to determine their rate of heating under various conditions. Their report, on the Spontaneous Combustion of Coal, is a very valuable work, and its conclusions will be referred to repeatedly in the following pages. They also supplement the description of their own tests with an extended review of the literature of the subject.

Habermann[3] experimented with coals at 50° C. in a fire-brick retort, and, supplying them with air at 26° C., ignition occurred in 36-39 hours. He found that the most easily oxidizable coals were those which were attacked by bromine with greatest avidity.

Dennstedt and Schaper[4] (1912) experimented with coals in a current of oxygen at a temperature of 150° C. They concluded that coals which show no tendency to increase in temperature under these conditions are absolutely safe; that coals which may heat locally, but do not heat generally in one hour are safe enough for transport in ships, and for storage in piles; that those which ignite within one hour are unsafe; and that those which ignite when subjected to the same tests at temperatures below 150° C. are exceedingly dangerous.

They also note that the greater the percentage of oxygen in the coal the greater will be the liability to give trouble.

Lamplough and Hill[5] (1913) after experimenting on several English coals, chiefly from the Barnsley seam, came to the conclusion that pyrite plays a larger part in spontaneous combustion than the majority of recent students have believed. Their paper and its discussion and criticism are of considerable interest and will be dealt with later.

Winmill[6] (1914) describes the first of a series of experiments which are now being carried on for the Doncaster Coal-owners Association. He discusses the relative rates of oxidation of various parts of the Barnsley seam, the effect of size of the coal dust particles on the rate of oxidation, the effect

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[1] (a) Losses in storage of coal (H. C. Porter) Journ. Ind. and Eng. Chem. Vol. II, 1910, pp. 77-83.
(b) The volatile matter of coal (Porter and Ovitz) Bull. No. 1, U. S. Bureau of Mines, 1910.
(c) The escape of gas from coal (Porter and Ovitz) Technical Paper No. 2, U. S. bureau of Mines, 1911.
(d) Deterioration and spontaneous heating of coal in storage. Tech. Paper No. 16, U. S. Bur. of Mines, 1912.
(e) The Spontaneous Combustion of Coal, 8th International Congress of Appl. Chem. Vol. X, 1912, pp. 251-267.
(f) The weathering of the Pittsburgh coal bed (Porter and Fieldner) Tech. Paper No. 35 U. S. Bur. of Mines, 1914.
(g) A study of the oxidation of coal (Porter and Ralston) Tech. Paper 65, U. S. Bur. of Mines, 1914

[2] Bull. 46 Univ. of Illinois Exp. Sta. 1910.
[3] Schillings Jour. fur Gasbel. Vol. XLIX. 1906, pp. 419-422.
[4] Zeit f. Ang. Chemie Vol. 51., 1912, pp. 2625-2629.
[5] "The Slow Combustion of Coal Dust and its Thermal Value." T. I. M. E. Vol. XLV, 1913, pp. 629-657
[6] "The Absorption of Oxygen by Coal." T. I. M. E. Vol. XLVI, 1913, pp. 559-591.