

HISTORICAL SURVEY OF PREVIOUS INVESTIGATIONS ON WEATHERING OF COAL.

In the following six pages an attempt is made to summarize very briefly the statements of a number of the more important writers in chronological order. The literature of this subject is very voluminous, and only a fraction of the papers are mentioned. In subsequent pages several of the papers referred to and others not mentioned here will be extensively quoted or abstracted and their conclusions discussed. A much more complete bibliography will be found at page 184 et seq.

The earliest authoritative discussion of the causes of weathering and particularly of spontaneous combustion seems to have been in a series of three reports to the British Parliament by **De la Beche and Playfair**, (1846-50) on "Steam Coals for the Royal Navy". They discuss the probable causes of heating and give analyses and arguments leading to the conclusion that considerable quantities of fines or dust in the coals are more likely to give trouble than the mere presence of pyrite.

Regnault¹ (1855), experimented with coals which he analysed, sealed up in corked flasks and set aside for twenty years; on re-analysis he could detect no alteration, probably because his chemical methods were not sufficiently delicate. Regnault, no doubt following Berzelius, however, states that pyritic coals are known to weather.

Marsilly² in his "Etude des houilles consommées sur la marche de Paris," notes that he believes that coals from gassy mines suffer change on exposure to air, but he does not venture to express an opinion regarding non-gassy coals. Marsilly also notes that coal dust exposed to air loses hydrocarbons, and also some of the substances which determine coking power.

Grundmann³ (1862) conducted extensive experiments on the weathering losses of coal, and found that large pieces weather less than small; he also found that increase of temperature accelerated the weathering. His experiments on the loss in weight of coal were chiefly of use in that they attracted attention to the subject, his high apparent losses being probably due to poor sampling.

Percy⁴ (1864) was apparently the next observer to ascribe spontaneous combustion of coal chiefly to oxidation of the carbonaceous matter of finely divided coal (dust) rather than to the pyrite as had commonly been assumed.

Varrentrapp⁵ (1865) kept coal at a constant temperature of 284° C, and claims that it was soon completely oxidized, the coal itself, however, must have risen to a much higher temperature.

¹ (A). Annales des Mines, 3rd Series t. XII, 1837, pp. 161-240.

(B). Rapport sur la fabrication des gaz—Annales des Mines, 5th Series t. VIIth 1855, pp. 1-67.

² Etude des houilles consommées sur la marche de Paris, Annales des Mines, 5me Series t. XII, 1857, pp. 347-446.

³ Carnall's Zeitschrift, Vol. X, 1862, p. 236.

Kerpely Bericht, 1866, pp. 32, 33.

Zeitschrift für Berg- und Hütten- u. Salin, Vol. X, 1862, pp. 326-332. Vol. XIV, 1866, pp. 52-72.

⁴ Chemical News, Vol. X, 1864, p. 19.

"Metallurgy", Vol. Fuel I, 1875, pp. 289-298.

⁵ Dinglers Poly. Journal, Vol. 175, 1865, pp. 156-158.

Dinglers Poly. Journal, Vol. 178, 1865, pp. 379-384.