CHAPTER II.

A GENERAL DISCUSSION OF WEATHERING.

WEATHERING IN NATURE.

Weathering in nature takes place at and near the outcrop of coal seams, and in some cases this action has even resulted in spontaneous combustion, and considerable quantities of coal have been completely or partially destroyed in place in the beds.[1] Ordinarily, however, the natural weathering of seams is too slow to cause fire, and all that happens is the disintegration of the coal, accompanied by the loss of part of its combustible matter, and a more than equivalent increase in ash. Outcrop coals are thus almost always of poor quality, but fortunately the damage rarely penetrates far into the seam, and coal as ordinarily mined shows little or no sign of oxidation in the destructive sense in which the term is used in this discussion.

The artificial or commercial weathering of coal begins the moment the miner's pick exposes its surface to the air of the mine, and this weathering continues with increasing, or decreasing intensity, depending on circumstances as long as the coal is exposed to the air. Weathering may thus be considered as taking place (a) in or near outcrops or fissures in nature; (b) in the coal mines; (c) on the surface during preparation and in transit; (d) in storage while awaiting use.

The first case is of little interest or importance except to the geologist and will not be discussed in this report, but the other cases are all deserving of separate consideration, although the general phenomena of weathering are alike in all.

WEATHERING ACTION TAKING PLACE IN THE MINE.

Changes undoubtedly commence to take place in coal immediately upon mining, owing to the alteration of conditions. Coal in situ is under pressure due to the superincumbent strata, and it is also absolutely removed from contact with the atmosphere, but as the mining operations approach the coal the gases, which it ordinarily contains under pressure, begin to escape. This evolution of gas becomes more rapid when the coal is actually broken down, and for a time probably almost protects it from oxidation, but both oxidation and desiccation no doubt commence almost immediately and increase as the escaping gases decrease, and cease to protect the coal from the action of the air.

[1] The Burning of Coal Beds in place, by A. Bowie, Am. Inst. Min. Eng. Bull. 86, pp. 195-204, February (1914).