

SOME PROBLEMS CONNECTED WITH THE COALS  
OF ILLINOIS.

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I. WEATHERING OF COAL.

Summary of results:

- (a) Submerged coal does not lose appreciably in heat value.
- (b) Outdoor exposure results in a loss of heating value varying from 2 to 10 per cent.
- (c) Dry storage has not advantage over storage in the open except with high sulphur coals, where the disintegrating effect of sulphur in the process of oxidation facilitates the escape of hydrocarbons or the oxidation of the same.
- (d) In most cases the losses in storage appear to be practically complete at the end of five months. From the seventh to the ninth month, the loss is inappreciable.
- (e) The results obtained in small samples are to be considered as an index of the changes affecting large masses in kind rather than in degree, but since the losses here shown are not beyond what seems to conform in a general way to the experience of

users of coal from large storage heaps, it may not be without value as an indication of weathering effects in actual practice.

Further studies are to be continued, having reference to actual storage conditions.

## II. DETERIORATION OF COAL.

Summary of results:

(a) An exudation of combustible gases from coal occurs from the time of breaking out of the sample from the vein.

(b) An absorption of oxygen accompanies the exudation of hydrocarbons.

(c) Samples of coal in most carefully sealed containers are subject to deterioration.

(d) The process of deterioration is probably due to oxidation of hydrogen or hydrocarbons by means of the absorbed oxygen. It may also be due to a simple loss of combustible gases and the replacement of the same by non-combustible gases such as oxygen.

(e) The rapidity or extent of this deterioration varies with different coals but is probably most active during the first two or three weeks from the taking of the sample, and does not seem to reach a normal state till after a few months have elapsed. Further data on this point especially are necessary.

It is interesting, also, to bring together the averages of the results in the three tables for further comparison. There is thus afforded further evidence suggesting the fact of deterioration.