

nized that the small "mine sample" taken from the mine usually indicates a higher economic value for the fuel than is actually delivered in carload lots, due to greater care in the separation of extraneous matter from the coal of the "mine sample."

It is evident, therefore, that it will be to the best interests of the contractor to furnish a correct description with average values of the coal offered, as a failure to maintain the standard established by the contractor will result in deductions from the contract price, and may cause cancellation of the contract, while deliveries of a coal of higher grade than quoted will be paid for at an increased price per ton.

The following suggestions are presented for the guidance of those who wish to send samples to the laboratory for analysis:

If samples are taken from carload lots, the sample should not be limited to a few shovelfuls of coal from the top of the car, as there is no certainty that the coal from the top of the car represents the entire carload. It is very probable that such a sample would not be representative. The sample should be taken from the coal as it is unloaded from the car, taking portions of coal from the entire carload. At least 100 to 150 pounds should be taken to represent a sample. It must be kept in mind that the main object is to obtain a sample of coal which represents as nearly as possible the entire quantity under consideration. The sample should contain about the same proportion of lump and fine coal as exists in the car or cars, or other form of delivery as a whole. If samples are taken from coal when delivered to buildings or yards, the sample should represent coal from the entire delivery.

The practice of taking a shovelful near the bottom of a pile of coal should be avoided, as the larger lumps of coal roll down and collect near the bottom, and such a sample will not truly represent the coal.

Each portion of coal should be deposited immediately in a metal receptacle having a tight-fitting cover. When the sample of from 100 to 150 pounds is secured, it should be placed on a clean dry floor, and the larger lumps should be broken up with a coal mallet or sledge, until the coal will pass through a 1-2" mesh sieve; the coal to be then thoroughly mixed by turning over and over with a shovel and heaped in a cone-shaped pile; the pile to be divided into four equal parts, two of the opposite quarters to be rejected and the remaining two again mixed and formed into a pile to be quartered as before; this process to be continued until the sample is reduced to a quantity which will about fill a quart jar. The final sample to be placed immediately in a quart glass jar, sealed with rubber gaskets (or otherwise hermetically sealed), packed in a box, and sent by express, PREPAID, to the "U. S. Geological Survey, Washington, D. C." The jar to be plainly labelled, giving the name of sender, and marked "Sample of coal for the Indian Service." A statement should accompany the sample, under separate cover, giving information for identifying it when received by the Survey; the commercial name of the coal, the name of the mine and location, name or other designation of the coal bed, and description as to how the sample was taken and prepared; carload or wagon delivery, tonnage each sample represents, and the date of sampling also should be given.

Two samples should be submitted to