surveyors. The treatise is a most satisfactory one for its purpose; its author is known as not only an authority and in all respects competent, but as one of the most accurate and painstaking of writers. His work will undoubtedly find its place promptly, and will be adapted for purposes of instruction in many schools of the higher class, and will supply multitudes of young engineers with the facts and methods that they require in their practice.


Mr. Seymour has collected in this book a great mass of statistical and geological information which cannot fail to be useful and valuable to all who are interested in the West Virginia coalfields. In the first chapter a brief review is given of the coalmeasures as they occur in the southern part of the State, and this is followed by chapters giving details of numerous sections. We have first tables of vertical sections giving the name used by the Pennsylvania Survey, the local name, height or thickness, material, etc.; then tables of chemical analyses, tables showing comparative gas-yielding power, steam-producing power, and chemical analyses and physical tests of coke. This closes part one.

In part two we have sketches of various districts and tables showing the output, cost of production, transportation, and average prices obtained in a series of years. In these days of pools and combines by railroads, and of trusts by manufacturers, it is of interest to note the immense difference in cost of transportation when water and land carriage is considered. The Great Kanawha River has been improved under the auspices of the general government by means of locks and dams so as to afford continuous transportation facilities for about ten months out of the year. The most of the dams in the river are "movable," that is, can be lowered to the bottom of the stream in high water and raised when the river falls, so as to afford a constant depth of six feet.

The coal is carried in barges averaging about 300 tons, or between 12,000 and 13,000 bushels. The barges can be easily handled by a tow-boat in the locks, and from 4 to 14 in the open river; while on the Ohio from 14 to 34 barges are taken by a single tug. Thirty barges contain about 13,000 tons, equal to a continuous train of 20-ton railroad cars 51 miles long. The rate of towing this coal from Charleston, W. Va., to Cincinnati, a distance of 268 miles, is only 25 cents per ton, or, to those who hire barges and so pay rent for them, 371 cents per ton. To Louisville, 394 miles from Charleston, the rate, including rent, and the return of barges, is 49 cents per ton, or 1,429 mills per ton per mile. For the longer distance to New Orleans, 1,776 miles, the cost is $1.23 per ton, or 6.2 cents per ton per mile. Contrast this now with the cost of railroad freight from New York to Chicago, 1,103 miles, and we have $1.50 per ton, or 5 mills per ton per mile, against 1,429 mills per ton per mile for 1,776 miles to New Orleans. Surely nothing can show more clearly the value of water carriage to the community as a whole, and no better argument could be advanced in favor of the continued development of our river, canal and lake navigation.

JOSEPH F. JAMES.


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