

calorific value of coal and the effects of the different impurities on the calorific value, the proper selection of coal with regard both to calorific value and furnace efficiency. I will also endeavour to present a reasonable basis on which specifications can be drawn that will be of equal advantage to both dealer and consumer.

The object of this paper is to bring to the engineer and buyer a better understanding of the results to be obtained from coal analysis, both in the selection and purchase, and to bring to the consumer an idea of the advantages to be gained in having chemist, engineer and buyer working in unison.

The geologist tells us that coal is the product produced by the burying out of contact with air of the prolific vegetation of bygone centuries. That this vast vegetation, having undergone certain transformations down through the ages, has resulted in coals varying from the high grade anthracites of the Pennsylvania fields to the lignites or brown coals of the west. Between these extremes we have the grades designated as semi-anthracite, semi-bituminous, bituminous and sub-bituminous, with many variations of each in different localities.

An estimate of the total coal reserves of the United States, while not altogether accurate is at least interesting. The original total coal reserve, within 3,000 feet of the surface, is estimated to have been 3,554,383,400,000 short tons, of which up to the present there has been used something like 15,000,000,000 short tons, or less than one half of one per cent. The present rate of consumption in the United States is about 500,000,000 tons per year, so that even if the present consumption were doubled, the visible supply would last for 3,500 years. This estimate does not include lignite, which is coming more and more into prominence as a source of power through its use in the producer-gas plant, and of which the North Dakota fields alone contain about 500,000,000,000 tons. Added to this the coal reserves of our own country, Nova Scotia, British Columbia, Saskatchewan and the enormous deposits in Alberta, also the vast areas in Alaska, to say nothing of new fields being discovered and yet to be discovered, and we have a total coal reserve on this continent that should keep the wheels moving for a good many centuries.

From the foregoing estimates, it is evident that we need not worry over any immediate shortage in our fuel supply, nor attribute all the economies effected in power plant efficiency to the movement for a conservation of our natural resources, but we must also give credit to the natural desires of the engineering profession to effect these economies for their own sake, as a result of knowledge gained during past years. However, the great incentive for all these economies has been competition,