one interested in the teaching of elementary Physiology. There is an adequate index.

A. S. R.

Further Experiments upon the Water-Gas Process. By J. G. King, B.H. Williams, and R. V. Thomas. (Department of Scientific and Industrial Research. Fuel Research. Technical Paper No. 43, 1935.)

This publication is a sequel to the earlier studies in which methods were described to study the carbon and thermal balances in producer-gas process.

The investigations described in this paper are arranged in four parts. The first part is devoted to a study of the causes of clinker formation in the generator and the devices employed to minimise the accumulation of clinker, especially such as would adhere firmly to the walls of the generator and cause serious inconvenience. Observations of the distribution of temperature at various regions of the fuel-bed, as well as of the velocity of flow of gas at the sides and central regions of the generator provided data which suggested (*a*) that while charging the generator, a device should be employed to keep the larger lumps of coke in the centre and let the coke breeze pack the sides, and (*b*) that the grate should be so arranged that air flows into the fuel-bed at the centre of the grate. These two devices helped to keep the zones of high temperature in the fuel-bed in the centre, and to keep the walls relatively cool and also to prevent the coke-ash from overheating and lead to formation of large and hard masses of clinker. Such a generator was operated successfully for a considerable period with four different specimens of coke whose ash fusion temperatures (in a reducing atmosphere) ranged from 1200 to 1500° C.

The second part presents the results of investigations on the effect of the rate of blowing on the efficiency of the process. With the aid of general considerations from the thermal point of view of the reactions between air and carbon, and also of the conditions prevailing in the gas-generator, an equation has been developed to connect the efficiency of the process with the rate of blowing. Experimental studies with different rates of blowing were carried out with a view to ascertain the variation in composition of the blow-gas and also of the thermal losses incurred. The results obtained were in conformity with the theoretical considerations, *viz.*, the rate of blowing should be as high as practicable in order to reduce to a minimum the percentage of carbon monoxide and also to reduce thermal losses. It is at the same time necessary to regulate the period of blowing so as not to exceed the optimum temperature in the fuel-bed.

The effect of the size of coke on the efficiency of the process was studied systematically with reference to *effective surface*, *reactivity*, *time of contact*, composition of the gases obtained and thermal output. It was found that variations of the size of coke in the range 0·1″ to 3·0″ had no marked effect on the efficiency of the process.

The next point studied was the efficiency of the process when using different types of coke, *viz.*, vertical retort, horizontal retort and low-temperature coke. No significant variations were found, the process efficiencies being 72·4, 75·1 and 72·9 per cent. respectively.

The various sources of error which would tend to vitiate the results are examined in detail and presented in an appendix. These errors are small and are due to (*a*) hydrogen from sources other than the water-gas reaction, (*b*) nitrogen in the coke, (*c*) sulphur in the coke, (*d*) moisture in the air, and (*e*) dilution effects.

K. R. K.

Forthcoming Events.

4 Jan. 1936—The Second Indian Road Congress at Bangalore.

2—8 Jan. 1936—Indian Science Congress—23rd Annual Meeting, at the Daly College, and King Edward Hall, Indore.

2—4 Jan. 1936—
All India Obstetric and Gynæcological Congress, 1936 (will be held at Madras).

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