Methods of analysis, etc., cont.

bustion tube, and a tuberlature at the top for the reception of a thermometer—the position of the latter was just a little on one side (forward) of the centre, the bulb being on a level with and almost touching the combustion tube. When the latter was in position, that part containing the column of asbestos and lead dioxide mixture, extended over the furnace proper, passing into the air-bath, which completely enclosed this portion of the tube. The bath which was heated by a separate burner, was maintained throughout the operation at a temperature of 150° to 170° C.

The results of a preliminary analysis of cane sugar were as follows: Employed 0.3083 gram of chemically pure sugar, dried at 100° C., this gave 0.4755 gram carbon dioxide, and 0.1794 gram of water: hence percentage composition of sugar:

	Found.	Calculated.	Difference.
Carbon	42.06	42.10	— 0.04
Hydrogen	6.46	6.43	+ 0.03
Oxygen	51.48	51.47	
	100.00	100.00	

Specimens numbers 2, 26, 28, 30, 31, 32, 33 and 35 all contained more or less calcite. The total amount of carbon dioxide was in each instance determined, as was also the amount remaining in the ash, and corrections made for it in calculating the composition of these fuels.

V. CALORIFIC POWER.—*Experimental.* The determinations were made in a Thompson's calorimeter. The method of procedure recommended in the use of this instrument was closely followed, and every attention was paid to the various details which recent experience has shown to be essential to the obtaining of trustworthy results. These latter are expressed in calories (calorie = one gram of water raised through 1° C. of temperature) and as pounds of water evaporated per pound of fuel: the numbers given in the text, in connection with the analyses are those indicated by the instrument. The corrections to be applied for heat rendered unavailable by reason of the hygroscopic and combined water, are given under Remarks on Tables I. and II.—page 43 M.

V¹. CALORIFIC POWER.—*Theoretical.* Data employed in the calculation: calorific power of carbon, 8080—calorific power of hydrogen 34,462—calorific power of sulphur, 2221—latent heat of steam, 537° C. In consideration of the amount of sulphur in these fuels being, with one exception, so very small, the heat units due to the combustion of this element have been disregarded.

[In calculating the calorific power of a fuel from its elementary composition, it is assumed that the oxygen is in combination with hydrogen