## Illuminating Power and Corresponding Calorific Values

to tests each of coal gas—water gas—and a mixture of coal and water gas.

Sugg's	ard. Junk	Junker's Calorimeter.		
		Candle Power	Calorifi	c Value,
Test No.	Kind of gas	Sugg's	Gross.	Net.
	used.	16 c.p. standard.	1.10 .14	-in a still
I	-	17.85	652.6	584.06
2		17.46	677.3	621.98
. 3	Straight	17.72	662.0	598.01
4		16.92	621.80	575.74
5	Coal	17.38	685.10	630.04
0		18.53	703.0	647.84
7	Gas.	17.81	665.30	605.20
8		18.68	674.60	593.53
0		16.85	626.80	584.53
10		16.22	614.40	557.09
1		17.46	587.30	536.67
2		19.42	585.70	535-35
3	Straight	19.92	600.00	586.01
4		19.43	592.42	555-59
5	Water	17.52	617.20	580.28
6		20.20	610.50	587.33
7	Gas.	21.72	612.40	577.48
8		20.77	612.10	572.39
0		18.53	565.00	538.33
10		18.08	570.60	538.50
I		15.64	587.30	533.09
2		16.06	601.30	541.37
3	Mixture	17.31	623.60	578.14
4	of	19.42	631.90	599.30
5	Coal	18.33	626.40	575.29
6	and	18.29	626.30	575.79
. 7	Water	17.39	621.10	575.22
8	Gas.	17.32	612.50	576.33
9		18.41	629.60	581.30
10		17.34	614.08	554.82

Illuminating Power and Corresponding Calorific Values

to tests each of coal gas—water gas—and a mixture of coal and water gas

No. 2	Metropolitan	Standard. Ju	inker's Caleri	meter.
		Cand'e Power	Calorific	Value,
Test. No.	Kind of ga	No. 2,	Gross.	Net.
	used.	Metro. standard.		
I		17.79	587.30	533.09
2		18.38	590.80	558.68
3	Straight	19.58	653.70	598.32
4		19.15	607.50	560.70
5	Coal	19.30	614.30	554.69
6		20.48	644:00	588.12
7	Gas.	20.74	667.60	611.65
8		21.40	639.80	586.52
9		21.11	631.70	575.60
IO		20.54	621.00	565.34
I		22.48	605.10	554.34
2		22.83	604.10	557.15
3	Straight	23.53	625.00	592.36
4		22.91	614.40	563.82
5	Water	25.10	612.40	577.48
6		21.94	570.60	530.50
7	Gas.	21.70	565.00	538.33
8		22.09	590.80	558.68
9		21.27	598.30	593.65
IO		23.68	610.50	587.33
I		21.05	624.00	610.19
2		21.15	638.90	589.70
3	Mixture	21.92 *	668.40	603.13
4	of	22.59	634.70	592.91
5	Coal	22.00	609.90	572.67
6	and	21.59	621.30	569.91
7	Water	21.03	610.50	576.29
8	Gas.	19.85	632.20	590:54
9		22.09	626.40	575.29
10		20.54	623.60	578.14

## Illuminating Power and Corresponding Calorific Values 15 tests of pure coal gas using

Sugg's	16-Candle	Standard and	Junker's	Calorimeter
	Sugg's 16 candle		Calorific Value,	
Test No		standard	Gross.	Net.
I		II.76	575.25	538.96
2		11.87	548.20	501.69
3		13.83	603.90	546.76
4		14.32	607.50	560.70
5		15.56	610.40	575.57
6		15.83	633.30	577.59
7 .		16.06	627.30	557.62
8		16.17	632.10	571.57
. 9		16.71	644.00	588.12
IO		17.27	639.80	586.52
II .		17.81	665.30	605.20
12		18.03	633.10	579.38
13		18.28	648.00	578.92
14		18.68	674.60	593.53
15		19.00	669.00	611.30

These figures show how radically changed the conditions are to-day in the matter of using gas as compared with 1886. In 1886 when the Argand burner was adopted by the Government as the Standard burner for testing the gas, 90 per cent. at least of the total gas sold was used for lighting by luminous or open flame burners. This necessitated making high candle power gas so that with the "Standard Burner" a light equal to at least 16 candles could be obtained -the gas being consumed at the prescribed rate of 5 cubic feet per hour. In 1886 the Government decided that gas companies would have to maintain a 16-candle standarda regulation intended to protect the consumers who used those luminous flame burners against the possibility of getting poor light. But remember that was in 1886, 24 years ago. The Argand and flat flame burners were the only ones in general use then and practically all the gas made was used by these burners. Now look at the changed conditions in 1910; only 11 per cent. of the total gas made is now used by luminous flame burners against 90 per cent., 24 years ago. To-day, as much as 89 per cent. of the gas made is being used for the combined purposes of heat, fuel, and mantel lighting; in 1886 approximately 10 per cent.

Taking into consideration these changed conditions of using gas, it is evident that what the gas industry is called upon to supply to-day and in the future is not a "lighting," but a "fuel" gas. We do not push the sale of a single gas appliance nowadays that necessitates the making of high candle gas. The gas range, water heater, gas engine, industrial furnace, gas arc, gas fan, etc., can all be well served with a lower grade gas than that prescribed by the 1886 Act.

Turn now to the tabulated statements B, C and D. It has already been stated that these tests were made for the purpose of obtaining reliable information based on Canadian practice to lay before the Deputy Minister and Chief Electrical and Gas Inspector, should the association decide to recommend a reduction of the candle power or the substitution of a calorific standard in its stead. There is no doubt in the minds of your committee that the calorific standard will eventually supersede the candle standard in Canada, but just how far the Government are prepared to go in the matter at this time we have no means of knowing. At any rate it is safe to assume that when it is made known to the authorities, that, in the opinion of the Canadian Gas Association, a change in the statutes is necessary in view of the radically changed conditions of using the gas, that either a reduction of the candle standard will be granted or the candle standard will give place entirely to the calorific standard.

Two important facts are to be deduced from the tabulated results of the tests referred to,

(1) That coal gas of about 12 candle power (Table D) as tested by the Sugg 16-candle standard containing about 540 B.T.U. net is sufficiently high in heat units for all practical requirements and the No. 2 Metropolitan burner

The difference in the efficiency of the old Sugg 16-candle standard burner and the new Metropolitan No. 2, when testing gases lower than 16 candles is very marked, but this is to be expected, because, whereas the Sugg Standard is made to test 16 candle gas only, the South Metropolitan burner with its adjustments can be adopted to test correctly any gases higher or lower than 16 candles.

> Arthur Hewitt John Keillor (See also page 645)