Under normal conditions the whole of the load at both stations is carried by the gas and oil-driven plant, the steam plant being used only as a reserve during repairs to the more economical, but less reliable, internal combustion engines.

It will be seen that no engines were installed during 1912, except the last set at St. Sampson's, and this was not running until 1913; consequently in the following figures all the results are from engines which have run at least one year, and the majority for a longer period.

TABLE II.—Oil Engine, St. Sampson's, 1912.

Month.	Units generated.	Weight of oil, lb.	Lb. per unit gen.	Per ton.	Cost.	Per unit.
January...	46,154	34,957	·75	51/-	£39 15 3	·20d.
February	8,107	6,466	·8	56/6	8 1 8	·23d.
March ...	54,831	38,525	·70	,,	48 6 4	·21d.
April ...	46,966	32,281	·687	,,	40 9 8	·21d.
May ...	47,345	32,044	·677	,,	40 3 9	·21d.
June ...	43,976	29,689	·675	,,	37 4 8	·20d.
July ...	46,624	30,379	·651	,,	38 2 0	·20d.
August ...	46,053	31,400	·67	,,	39 7 7	·20d.
September	36,462	24,906	·684	,,	31 4 8	·20d.
October ...	30,259	21,228	·701	65/6	31 0 11	·25d.
November	4,999	3,503	·7	..	5 2 5	·25d.
December	35,909	26,515	·738	,,	38 15 6	·26d.
Total ...	447,685	311,893	·696		£397 14 5	·213d.

During 1912 the gas and oil engines generated 1,865,236 units, of which rather more than half was generated by the oil engines; consequently both classes of plant had to run for long hours.

Very careful monthly records were kept of the performance of each class of plant, and the accuracy of these figures is proved by the fact that the total of the invoices for coal and oil for the year exceeds the sum of the monthly figures by less than 2½ per cent., and this difference is probably due to small losses in storage, etc.

The figures in Tables I., II. and III., being abstracts from the monthly records, are worked out on the units generated, the units sold not being available each month.

In comparing the performances of the different types of engine, there are certain points to be taken into consideration.

TABLE III.—Oil Engines, Les Amballes, 1912.

Month.	Units generated.	Weight of oil, lb.	Lb. per unit gen.	Per ton.	Cost.	Per unit.
January...	59,459	40,045	·675	54/-	£48 4 5	·19d.
February...	73,010	47,234	·645	59/6	62 11 8	·20d.
March ...	54,381	36,813	·677	,,	48 15 6	·21d.
April ...	34,701	23,335	·672	,,	30 18 4	·21d.
May ...	39,028	26,247	·673	,,	34 15 6	·21d.
June ...	33,514	22,006	·657	,,	29 3 2	·21d.
July ...	34,698	21,827	·629	,,	28 18 5	·20d.
August ...	45,129	30,285	·67	,,	40 2 6	·21d.
September	26,857	17,750	·66	,,	23 10 4	·21d.
October ...	42,388	28,740	·678	68/6	43 18 8	·25d.
November	64,648	44,400	·688	,,	67 17 10	·25d.
December	64,862	44,760	·69	,,	68 8 11	·25d.
Total ...	572,675	383,444	·670		£527 5 3	·221d.

In the case of the gas engines, it must be remembered that two of these engines are more than eight years old; in 1911, they had got into a bad state of repair, with worn pistons, worn liners, etc., and it was decided to thoroughly overhaul all the gas engines and gas plant. This work was not completed until July, 1912, and the high fuel consumption of the first three months of 1912 is entirely due to the condition of the plant, and should be neglected when making comparisons. If, then, the months of April, May and June are compared, it will be seen that there was practically no difference in cost per unit for fuel between the gas and oil engines, but later in the year, although the cost of coal increased, the cost of oil increased in much greater ratio, and for the months of October, November and December the gas engines were very decidedly cheaper in fuel cost. This difference in cost is even more marked at the moment of writing, so much so that the Diesel engines are being run as little as possible, and the gas engines as much as possible. This preference for the gas plant is entirely due to the enormous increase in the cost of fuel oil, which has gone up 75 per cent. in price in less than two years.

In Tables II. and III., if the "lb. of oil per unit" column is examined, the wonderfully even running of the Diesel engines will be noticed.

Table III. shows this to most advantage, because the load factor of these engines is more nearly constant from day to day, and also because the engine in Table II. has developed more defects than the engines in Table III., which have run practically without trouble for the whole of the year.

The running of these Diesel engines shows very clearly one remarkable fact—the full load guarantee being .67 lb. of oil per unit, the actual consumption for the year exceeds the guarantee figures by less than 5 per cent.

Everyone who has had to run steam plant under similar conditions knows that the test results will be exceeded by at least 50 per cent., and even with gas plant it is difficult to keep within 20 per cent. of test figures.

It is quite possible to take one or two individual figures in these tables and query their accuracy. For instance, in Table III. the month of July shows an impossibly good figure under "lb. per unit." There are reasons for this, and other small errors, which it would be tedious to explain, and it was thought advisable to give the figures exactly as recorded without any alterations; that any small error in one month corrects itself later is proved by the close agreement with the figures for the complete year.

Table IV. shows the costs per unit sold for 1912 abstracted from the balance-sheet and given in detail, so that the station costs can be seen separated from the distribution costs. It should be mentioned that no part of the cost of the special overhaul to the gas plant is included in these figures.

TABLE IV.—Costs Per Unit Sold for 1912.

Generation—	
Fuel	·33d.
Oil, waste, water, etc.	·08d.
Wages and salaries	·16d.
Repairs—Buildings, plant, tools	·16d.
Accumulators	·05d.
	·78d.
Distribution—	
Wages and salaries, repairs mains, meters, etc.	·08d.
Rent, rates, taxes and insurance	·07d.
	·18d.
Management	·01d.
Total running costs	

The above cost is without any interest charges, etc.

$$\text{Efficiency} \frac{\text{Units sold} \times 100}{\text{Units generated}} = 78 \text{ per cent.}$$