## THE COST OF POWER AS A FACTOR IN LOCATING INDUSTRIES.

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THE above title implies a subject that is of interest to every progressive city in Canada. There is a very general impression that the cost of power is a largely determining factor in inducing most industries to select a location, and constant repetition of this claim has caused its general acceptance. Little investigation appears to be made, however, as to the basis of this belief, in which industries the cost of power is an important item and as to what proportion the cost of power bears to the total cost of production or total expenses.

This impression leads cities, which means the councillors in power in any particular year, to embark on expensive and in many cases doubtful projects for providing cheap power, without having any definite knowledge as to what industries the general local conditions will make it possible to locate, or of the relative importance of cheap power to such industries.

The questions of distribution facilities, proximity of raw materials, extent of labor market, etc., are awkward matters that cannot be controlled by that year's council, and they are, therefore, left in the background, while it is decided to enter on some extensive project to provide cheap power in the hope that this will make everything all right and produce a rush of industries anxious to take advantage of it.

The fallacy of this view has been impressed upon the writer by various personal experiences and has led him to collect a large amount of data on the cost of power in different industries. A large amount of manufacturing data has also recently become available in the statistics issued by the United States and Canadian census bureaus, the Ontario Bureau of Labor and other sources, and it is, therefore, possible to tabulate the average proportionate costs of many different industries in a manner to give an approximate idea of their relative importance.

A comparison of these statistics by such factors as the per cent. of wages to gross value of product and the ratio ratio of the value of the product to the capital employed shows that, while the figures vary appreciably in the two countries in some individual industries, if the average is taken taken over a considerable number of miscellaneous industries they are in very close agreement and that, there-fore, they are in very close agreement and that, therefore, the conditions are not widely different. On the whole, the United States statistics are the most satisfactory to work to, because the explanation given of the meaning to work to, because the explanation given and exmeanings of the terms, the precautions taken and ex-actly what the headings include, is much more complete and specific and specific than in the others. It involves some little labor to dig out the figures and give them in the form shown, but the tables that follow are deduced direct from the converting the tables that follow are being the rate for the census figures, the only assumptions being the rate for interest interest and depreciation on the stated capital and an assume the stated borse-power assumed price per h.p.-year for the stated horse-power employed.

A certain number and class of industries will attach themselves to every town in proportion to its population and other local conditions, entirely irrespective of the cost of power.

Such industries in a town of 5,000 population would and grist mill, planing mill, mineral water factory, elevators, etc. When it reaches 12,000 or 15,000 there may be added, still without regard to cost of power, further factories of the same class and in addition a foundry, brewery, sash and door factory, tent and mattress factory, etc. At 50,000 population, and still without regard to cost of power, there would probably be, in addition to the foregoing, some or all of the following: box-works; abattoir and cold storage, harness factory, soap works, creamery, show-case factory, etc.

The results are so general that a little investigation will satisfy anyone that they are obtained under normal conditions irrespective of the cost of power.

The reason can be clearly seen from Table I. on consideration of the percentage cost of power, compared to other items of expense incurred by miscellaneous medium sized industries. It will be seen that at the assumed figure of \$50 per h.p. year the highest figure for the cost of power in per cent. of total costs is under 6% and the average is 3%.

The intention in this and the following tables is to give a fairly approximate idea of the proportion that the cost of power bears to the other items of expense, not to attempt to give an exact figure of the cost of the power itself, which must vary in each case in each industry.

Before proceeding further it will be well to explain the basis on which this table is constructed, so that those interested can make any allowances they see fit.

The total capital employed is given in the census reports for each group of industries and it is specified that the expenses given do not include interest and depreciation.

"Materials" include all raw materials, mill supplies and containers. It also includes (as given in the census reports) fuel, rent of power and heat; and fuel includes all fuel used whether for heat, light or power or for process of manufacture.

Salaries and wages include labor for power and this latter cannot be given separately.

Power. The census returns show the primary power employed in each industry, but do not give the cost of power separately, this being included in "materials" and in wages, as above stated. The cost assumed for power has, therefore, been deducted from the amount given in the census reports for materials and the amount so deducted represents only fuel, oil, stores and water and rented power, or the equivalents. The writer finds that the average proportion of costs of producing power in factories, from a large number of individual cases where the costs were accurately kept, is as follows:

Fuel	50.00%
Oil stores and water	4.25%
Wages	17.00%
Renairs	4.25%
Interest and depreciation on power plant at 10%	
on investment	25.00%

100.00%

To correctly show the percentage cost of power it would therefore be necessary to correct the interest and depreciation column and the salaries and wages column shown in the tables. This can be easily done for any particular case but to do it to the whole of the table on an assumed cost of power would diminish the value of the original figures. Furthermore, it is not necessary to do so to support the contention as to the low percentage cost of power in miscellaneous industries.

If, for instance, taking the averages of the columns, power at \$50 represents 3% of the total costs and we assume that power costs 25% more or less than \$50, this will only be 25% of 3% or 0.75% on the total cost taken