CANADA

DOMINION BUREAU OF STATISTICS

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THE COMPRESSED GAS INDUSTRY IN CANADA IN 1918

Advance Chapter of

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The COMPRESSED GAS INDUSTRY in Canada in 1918.

The 14 establishments making compressed gases in Canada in 1918, produced 5,484,755 cu.ft. of acetylene dissolved in acetone, valued at $138,881; 33,880,000 cu.ft. of oxygen at $674,693; and 2,742,632 cu.ft. of carbon dioxide worth $221,001. By-products from the same plants were valued at $13,696.

Three plants bought acetylene for the purpose of compressing it into cylinders containing acetone in which form this gas is marketed, seven made both acetylene and oxygen, and four made carbon dioxide.

The widespread demand for the products of this industry is reflected by the location of the fourteen plants, four of which were in Manitoba; three in Ontario; three in Quebec; two in Nova Scotia and one in each of the provinces of Alberta and British Columbia.

The total investment in these plants amounted, at the end of 1918, to $1,736,193, of which $793,278 was the value of lands, buildings, machinery and tools, and $616,455 the value assigned to materials on hand, stocks in process, finished products, fuel and miscellaneous supplies on hand. The balance of $326,460 represented cash, trading and and operating accounts and bills receivable.

EMPLOYEES, SALARIES AND WAGES

The average number of persons employed during the year, both in offices and plants, was 265. The total amount paid in wages and salaries was $298,401 or an average payment of $1,126. Of the total sum the salaried employees received $105,779 and the wage-earners $192,6

The following table shows the distribution of salaried employees and wage-earners, the latter according to earning capacity, on December 15th, 1918.

	Male	Female
Officers, superintendents and managers...	96	1
Clerks, stenographers, salesmen and other salaried employees.....	33	34
OFFICE SUB-TOTAL.....	29	35

WAGE-EARNERS, receiving per week,	Male	Female
Less than $10	9	...
$10 but less than $15	11	...
$15 but less than $20	27	...
$20 but less than $25	57	...
$25 and over	83	...
WORKS SUB-TOTAL	187	...
GRAND TOTAL	246	35

The works sub-total, 187 shown in the above table is higher than the average number of wage-earners, for the year, due to the fact that several plants in were in operation only during the last four months of the year. The following table shows the number of wage-earners on the pay.roll on the 15th of each month throughout the year.

MONTH	Employees: Male	Female	MONTH	Employees Male	Female
January	153	1	July	168	1
February	156	1	August	170	1
March	158	1	September	181	...
April	166	1	October	189	...
May	167	1	November	189	...
June	161	1	December	187	...

FUEL AND POWER

The quantity of fuel used for power and heating was small, being valued at only $5,626, laid down at the works. Of this sum $1,104 was paid for 8,900 gallons of fuel oil, $3,999 for 424 tons of anthracite coal and the balance, or $523, for 51 tons of bituminous coal.

A large amount of power was used chiefly to run compressors. The firms making carbon dioxide used 9 motors rated at 300 horse power. The producers of acetylene and oxygen had 41 motors in their plants, rated at 1290 H.P., of which an average of 1080 H.P. was actually used.

MATERIALS USED AND PRODUCTS MADE.

The cost of the materials used for manufacturing was $89,042, while the products made had a value of $1,048,271. The increase in value due to the process of manufacture appears to be enormous, but comparison of these data is hardly fair since although the oxygen used is free as air, the work of abstracting it and bottling it up for commercial uses is considerable and necessitates heavy investments in machinery and equipment, on which earnings have

to be made. The compressed gas industry thus differs from most other manufacturing operations in that its principal expenditures are for plant, upkeep and power.

The accompanying table shows the quantity and cost at the works of the materials used during the year. Five plants failed to specify the quantity of calcium carbide used but included it with "All Other Materials." More complete returns are being obtained now so that subsequent reports from this Bureau will contain more specific data than it has been possible to present in this report.

MATERIALS USED

Kind	Unit of Measure	Quantity	Cost	Cost per Unit
Sulphuric Acid	Lbs.	5,000	175	$0.035
Acetone	"	25,843	9,967	0.385
Acetylene, bought by 3 firms	1000 cu.ft.	1,787	10,073	5.636
Calcium Carbide	Tons	82	4,922	60.024
Coke	"	1,851	29,662	16.024
Water	...	...	73	...
Caustic soda	...	...	67	...
All other materials	...	...	34,103	...
TOTAL			$89,042	

PRODUCTS

	Unit of Measure	Quantity	Value	Selling Value per 1000 cu.ft.
Acetylene dissolved in Acetone	cu.ft.	5,484,755	$ 138,881	$25.30
Oxygen	cu.ft.	33,880,000	674,603	19.90
Carbon dioxide	cu.ft.	2,742,032	221,001	80.59
Other by-products		...	16,696	...
			$1,048,991	

Other firms produced a considerable quantity of chlorine and hydrogen during the year, but consumed the whole production in their own plants, the former in the manufacture of bleaching powder and liquor, the latter for the hydrogenation of oils. The production of these two gases is considered in the reports on the industries under which the firms producing them are listed, namely, "Miscellaneous Drugs and Chemicals" and "Soaps."

MISCELLANEOUS EXPENDITURES

The following table itemizes the miscellaneous expenditures applicable to this manufacturing industry and it will be noted that the largest single item $28,079, was for power. When all these expenditures are added to salaries, wages, cost of fuel and materials used, the total disbursements for the year are found to have been $542,009.

Rent of office, works and machinery	$ 2,996
Rent of Power	28,079
Insurance (premium for year only)	9,496
Advertising Expenses	[illegible]
Travelling Expenses	6,[illegible]14
Repairs to buildings and machinery	6,[illegible]70
All other sundry expenses	85,068
TOTAL	$148,940

GENERAL COMMENTS

The selling value of the products has been shown to be $1,048,271, so that the earnings of the industry amounted to $506,262. On an actual money investment of $1,736,193, previously mentioned, the rate of earnings is found to be slightly over 28% which may be taken as indicative of the satisfactory financial condition of this industry in Canada.

Practically all the oxygen made was produced by the liquid air process. By this means air is compressed, cooled and expanded by a continuous process until it liquifies. The nitrogen, for which there is no market is then boiled off and discarded, leaving the oxygen to be bottled and sold. A small quantity of oxygen was also made by the electrolytic process. Oxygen is used principally in conjunction with acetylene in the oxy-acetylene blow pipe for cutting and welding metals, but it also finds considerable use in hospitals, chemical laboratories and metallurgical plants. Acetylene is produced entirely by the decomposition of calcium carbide in contact with water. Since acetylene is liable to violent decomposition when under pressures exceeding two atmospheres this gas is compressed into cylinders containing acetone, in which it dissolves. In this condition it is safe under 10 atmospheres pressure for use in such portable lighting systems as those on motor cycles and automobiles.

Carbon dioxide is the familiar soda water gas which is used for aerated water, carbonating liquors and very extensively in the manufacture of the refreshing drinks dispensed at soda fountains. It is produced in this country by passing air through incandescent coke. The carbon of the coke unites with the oxygen contained in the air to form carbon dioxide gas. This gas is then scrubbed and compressed into cylinders in which form it is placed on the market.
