maximum for any one day in July, 1916, was 16,677,240 Imperial gallons. The fire underwriters require that the system shall be capable of maintaining twenty-five standard fire streams for a period of ten hours, in addition to satisfying the normal demand. This quantity for fire purposes is equivalent to a rate of 7,500,000 gallons every 24 hours.

It is obvious that your pumping capacity is lamentably short of actual requirements, and in order to properly safeguard the city, I recommend that one steam pumping unit, of not less than 15,000,000 gallons capacity, together with the necessary boilers and appurtenances, including buildings and chimney, be installed with as little delay as possible. The building should be of such size that another unit, together with the necessary boilers, can be installed later on.

There are three types of pumping units which may be considered, *viz.*:—

1. High duty.
2. Turbine-driven centrifugal pumps (where a turbine runs at one speed and the pump runs at a much lower speed, this reduction being brought about by practically noiseless gearing).
3. Centrifugal pumps driven direct by triple expansion vertical engines.

The high duty unit is the most expensive and occupies the most space: It is also, however, the most economical in fuel consumption. The turbine-driven centrifugal unit is the cheapest and occupies the least space, and is next in economy to the high duty engine. The centrifugal pump, driven by triple expansion vertical engine, is about 15 per cent. less economical than the turbine-driven unit. Types Nos. 2 and 3 will show, however, a much greater economy than any of the steam pumping units you already have in operation.

Assuming that new buildings have to be erected for the pumps and boilers, and of such size that another pump and another set of boilers can be installed later on, I give below an estimate of the cost of each, *viz.*:—

	High Duty	Turb.-Driven Pump	High Speed Vertical Eng.-Driven Pump
Engine	$125,000	$ 55,000	$ 65,000
Foundations	4,500	1,500	2,000
Discharge main and valves (to present system)	5,000	5,000	5,000
4 water tube boilers, 3 of which are capable of running the units, together with steam connections	30,000	30,000	30,000
Buildings	60,000	30,000	30,000
Contingencies	5,000	3,000	3,000
5 per cent., engineering.	12,085	6,580	7,105
	$241,585	$131,080	$142,105

Following up this interim report, which was made August 22nd, Mr. Milne reported under date of September 7th to the Board of Control, making the following suggestions:—

The new engine room would be an extension of the present Osborne Kelly engine room, and foundations could be laid for a building capable of accommodating three large pumping units. It would be at your option as to whether the building, approximately 115 feet in length, should now be built.

Pump No. 3 would be the first installed.

The boiler room, when completed, will contain 14 water tube boilers, but only four will be required for one pumping unit, *viz.*, boilers 7, 8, 9 and 10.

As the plant is extended, the five return tubular boilers for the Osborne Kelly pumps will be replaced by water tube boilers.

A new 6-foot conduit from the basin will be required, same to discharge into a suction well, from which the new pumping units will take their supply.

From this suction well, a 48-inch connection shall be made to your present well.

The new pumping units will discharge into a 72-inch steel header, from which five 36-inch discharge mains can be taken: Discharge main A to be connected to your present header; discharge main B to be connected to the 36-inch main running from your present header; discharge main C to run to city and improve present conditions; branches D and E to be blank flanged for future extensions.

The cost of the 6-foot conduit from the basin to the suction well, together with well and connection to your present well, will be about $38,500; this conduit to be partly steel and partly concrete.

The discharge connection from pump No. 3 to, and including header, together with mains A and B, will cost approximately $27,500.

It is, no doubt, your intention to continue the use of the present electric pumps, even after the steam units are installed; and, such being the case, I could not advise you to install coal bunkers, nor mechanical stokers. These need only be considered if the steam pumping units were to operate continuously.

Provision, however, for the bunkers should be made in designing the building, so that they can be installed in the future, should operating conditions warrant.

A new pumping main will most assuredly have to be installed in the immediate future, but I am not prepared to say at present where this should be run to, as additional information will have to be given me as to pressures, etc., throughout the city.

Japan obtains more than 2,000,000 h.p. from its streams by nearly 400 hydro-electric plants.

The Chinese Government has concluded an agreement with the Siems-Carey Co., of St. Paul, Minn., for the construction of more than 2,000 miles of railways. The probable cost of this work will be over $100,000,000 and construction will begin immediately. This is the largest single railway contract ever signed by China.

The railroads of the United States used 128,200,000 net tons of coal in 1915, or 24 per cent. of the total output. The bituminous mines furnished 122,000,000 tons, or 28 per cent. of their production, and the Pennsylvania anthracite region 6,200,000 tons, or 7 per cent. its production. The roads in the eastern district, north of Potomac and Ohio rivers and east of Chicago, Peoria and St. Louis, used 56,500,000 tons of bituminous coal and 6,200,000 tons of anthracite, a total of 62,700,000 tons. The roads of the southern district, south Potomac and Ohio Rivers, and east of the Mississippi, used 22,000,000 tons of bituminous coal, and the western roads consumed 43,500,000 tons.

During the year ending June 30, 1916, Canada exported to the United States 52,742 tons nickel-copper matte containing 64,622,286 pounds nickel, and worth about $16,000,000. The value given in Government records is $8,596,921. During the same period Canada exported a large quantity of nickel-copper matte to Wales. Figures are not yet available, but the nickel contents of matte shipped to both countries will total about 76,000,000 lbs., worth about $19,000,000. In addition, the matte contained copper worth in the matte probably $5,000,000. In other words, there was shipped during the year ended June 30, 1916, from the smelters in Ontario, matte worth about $24,000,000. The metals in the matte when refined would be worth about $40,000,000.