

with centrifugal pumps at such a speed that the water, which will be sent out at a temperature of 150 degrees will only lose 30 degrees in the course of its circuit. With a temperature thus varying little and a pressure nearly constant, there will be little strain in the pipes; and, if the system is reasonably tight and the same body of water is continuously used, there should be no corrosion. The system should last and the heating promises to be equable.

#### MR. KIVAS TULLY.

Mr. Kivas Tully, late architect to the Government of the Province of Ontario, died on April 24th last in the 86th year of his age. Mr. Tully was an Irishman, the son of an officer in the Royal Navy, Commander John P. Tully. He was born in 1820 in Queen's county, and studied his professions (he was architect, surveyor and engineer) in Limerick. He was at first engaged in Limerick under Wilkinson, in the erection of public buildings, but in 1844, at the age of 24, came to Toronto and opened an office. He continued to reside in Toronto for the remainder of his life, but his work, in the days of his private practice, extended to the other towns of the province. He built the Town Hall of St. Catharines, the Anglican Church at Thorold, Victoria Hall and St. Peter's Church at Cobourg, besides houses in these and other places. In Toronto the old Custom House, the old Bank of Montreal, and the old Western Assurance Building, were his work, and, while still in private practice, he built for the Government the wings of the Lunatic Asylum. His most conspicuous piece of work, however, was Trinity College, Toronto. The front, with a short residential wing, was all that was completed of the original design, which is shown in a perspective drawing which still exists, as extending to about the same length on the west side as on the front, and equally ornate. The intention was to ultimately enclose a quadrangle. The requisite amount of building has in fact been accomplished in the course of time, but the different efforts have not been connected, and the building is now in the form of an E. The perspective drawing shows a chapel with a spire, situated apart, to the south-east of the building, but clear of the facade. There is also shown a stone retaining wall for the terrace, the absence of which in execution was always a source of regret to Mr. Tully. Its cost at the time of building would have been only £500.

When the Government of the Province of Ontario was constructed, just before Confederation, Mr. Tully was appointed architect and engineer. The offices were afterwards separated and Mr. Tully became architect, which position he filled until 1896, his 76th year. He then retired, but remained in the service of the Province, as consulting architect, until his death.

Some of the principal provincial buildings carried out under his direction were: The Central Prison, Toronto; Asylums in London, Hamilton, Brockville and Mimico; Institutes for the Deaf and Dumb at Brantford and Belleville; the Mercer Institute, Toronto.

Mr. Tully's work was not limited by his duties as Provincial architect. He was also, from the year 1852 until his death, engineer to the Board of Har-

bour Commissioners, and all works done in Toronto harbour by the commissioners were done under his direction.

He was frequently consulted on other matters. He was associated with Mr. McAlpine in 1887 in a report on the drainage of the City of Toronto; with Captain Eades in a report on the preservation of Toronto harbour; with Captain Eades again in a report on the proposed Toronto and Georgian Bay Ship Railway. He had previously made the requisite surveys for a proposed Georgian Bay Ship Canal, and an interesting model, made by him, of the portion of the Province through which the canal would have passed, has been exhibited in the Toronto Public Library.

Mr. Tully held high rank as a Freemason, and at his funeral, which was of a public character, the Masonic order took charge of the service at St. James' Cemetery.

He was one of the charter members of the Canadian Institute. In his earlier days he took part in municipal affairs in Toronto as School Trustee, Councilman and Alderman. In 1894 he was a delegate to the Deep Waterways Commission.

In recognition of public services Mr. Tully, in 1903, received the Imperial Service Order from the King.

Mrs. Tully, who was a daughter of Lt.-Col. Strickland, of Lakefield, died in 1883. There are two surviving daughters, Miss Louise Beresford Tully and Miss Sidney Strickland Tully.

#### HUMIDITY IN HEATED HOUSES.

Humidity in heated houses has been the subject of observations during the past year by Prof. R. C. Carpenter, of Cornell University, Ithaca, N. Y. The observations were made in his residence, which is heated by direct steam radiation, according to the Engineering News. He found that the humidity of the air in the house during the first half of the present winter ranged from 18 per cent. to 35 per cent., averaging, perhaps, close to 25 per cent. The humidity of the outside air during the same period ranged from 60 to 80 per cent., averaging about 70 per cent. As Prof. Carpenter says, the observations show that the air in his house is extremely dry, probably drier than that in most deserts. These results are identical with results of similar observations made by Dr. H. M. Smith, of New York City, some years ago and reported in a paper read before the Brooklyn Medical Society. Dr. Smith found that in an ordinary heated house the humidity through the winter of 1902 to 1903 was 24 to 30 per cent., while in the same period the average humidity of the outside air was about 73 per cent. He also made an experiment by keeping two adjoining rooms in a different moisture condition, one being at the normal heated house humidity, while the other by artificial moistening had its humidity maintained at about 60 per cent., which Dr. Smith calls "proper degree of humidity." The room with greater moisture was moreover, maintained at a slightly lower temperature, 65 to 68 degrees Fahrenheit, than the dry room, which was kept heated to 72 degrees Fahrenheit, its humidity being about 30 per cent. By getting opinions on the relative temperatures or degrees of comfort of the two rooms from various visitors who were told nothing of the experiment, Dr. Smith found that the room with greater moisture was estimated to be at least 2 degrees warmer than the dry room. He concluded from his experiments that with a proper degree of moisture, say 60 per cent., a room temperature of 65 degrees Fahrenheit is comfortable, 68 degrees is warm and 70 degrees is rather too warm. With rooms as dry as heated houses ordinarily are in winter a temperature of 72 to 73 degrees Fahrenheit is none too warm, and even this always leaves the impression of drafts of air.