sizes for distribution carried 439 ft. of coils ; 14 ft. 6 in. of 1 in. to 400 ft. same sizes, and 13 ft. 2 in. of 1¼ in. with 1¼ in. flow and return 1 in. and ¾ in. distributing branches, to 490 ft. of 1 in. coils gave good results.

ARTIFICIAL MARBLE.

A COMPANY is said to have been recently formed in Toronto with the purpose of manufacturing artificial marble from gypsum, by a process invented by Mr. Geo. W. Parker.

The material is made into clocks, pedestals, table tops and other fancy articles for which marble is frequently employed. The gypsum, while in its crude soft state, is cut into the desired form, being afterwards subjected to a chemical solution and polished. Prof. Coleman, the well-known geologist of the School of Practical Science, Toronto, speaks of the new material as follows :

"I have examined with great interest the specimens of 'artificial marble' shown me, and have discussed the patented process by which they were made. Mr. Parker, of Michigan, the inventor of the process, explained his method viz : Dehydration of gypsum by heat, continued for a few hours, soaking the dehydrated gypsum with sulphate of alumina solution and then drying the mass operated upon. By this means the gypsum, which is soft and easily cut with a knife, or turned on a lathe, is transformed into a hard substance very much like marble and capable of the same uses. The raw material is very cheap and obtainable in large quantities ; the treatment is simple and the result surprisingly good. A specimen of gypsum from western Ontario was given to Mr. Parker for treatment after being initialled by myself, and a fragment broken off for future identification of the mass. After treatment in the way mentioned, I found that it filled the fragment broken off and was evidently the identical mass of gypsum from my collection at the School of Science. But its properties were quite changed ; it is even harder than marble, which it closely resembles, and is not attacked so readily by acids, which is a point in its favor. So far as I have examined into the process, I am very favorably impressed by it. A cheap and easily worked substance is changed by two or three days treatment of a simple and inexpensive nature into a substance as beautiful and apparently as durable as marble, which is very costly when of good quality."

CHIPS.

The new management of the St. John's Stone Chinaware Company, of St. John's, Que., have given notice of application to the legislature for a special act of incorporation.

The Canadian Society of Civil Engineers, at their regular meeting on the 17th inst., will discuss what action should be taken in view of the expiration on the 1st of May next, of the lease of the rooms at present occupied by the Society.

The eleventh annual meeting of the Canadian Society of Civil Engineers is announced to take place at the society's rooms, 112 Mansfield street, Montreal, on Tuesday, January 12th. The council for 1897 will be elected and other important business transacted.

A new heating and ventilating apparatus has lately been placed in the Pictou Academy building at Pictou, N. S. The building is heated by two separate systems of heating, direct and indirect. The first named consists of radiators in the halls and coils in the rooms, the coils to be used only in the coldest weather. The indirect system is supplied by fresh air from the outside, which enters in the basement and is warmed to the required temperature, being then admitted to the rooms through large registers. Mr. Frank Powers, of Lunenburg, was the contractor for the heating work, and Messrs. Elliott & Hopson, of Halifax, were the architects.

TESTS OF CONCRETE.

SOME important tests of concrete were recently made at McGill University, Montreal, by Messrs. Theo. Denis, G. G. Hare and Carl Reinhardt, the results of which will be found below. The experiments are rendered particularly interesting by the fact that the general opinion of the effect of water on cement is somewhat erroneous. Following is the report of the tests as presented at a meeting of the Canadian Society of Civil Engineers :

Of late monolithic works of great importance have been carried out, and every day concrete, as building material, is creeping to a foremost place.

Although cement testing proper has been subjected to elaborate, scientific and practical investigations, very few researches, and especially normally conducted researches, have been made on the strength and behavior of concretes and betons. This probably is due to the fact that for such experiments heavy and costly apparatus is needed. Investigations on small specimens would be useless, and conditions approaching as nearly as possible to practice have to be followed.

The following are the results obtained from a series of experiments made by students of McGill University, 1895-96.

The object of this first series of experiments is to determine the effect of different per cents of water on the strength of the concrete. The limits were 16 and 30 per cent. of water, by weight of cement and sand, which are beyond the extremes of practice on both sides.

CEMENT.

The cement used was, of course, the same brand throughout the series. It was a German Portland of good quality, slow setting, on which separate sand tests were made in connection with this series. The results are tabulated below.

SAND.

This was clean, coarse, angular, dry sand of good quality, of slightly higher grade than usual practice.

STONE.

This was broken limestone of such size that the pieces would have passed through a ring 1¼ inches diameter. They were unscreened and just as they came out of the breaker. Consequently a slight amount of dust was mixed with them. They had to be broken a little smaller than in actual practice. The blocks of concrete being only one cubic foot, it was thought that more accurate results would be obtained in this way.

MOULDS.

The moulds were made of ¾ inch plank, lined with sheet zinc. They were 5 feet long, 1 foot high and 1 foot wide, divided into four compartments, which would mould four cubes at once, of dimensions 1 x 1 x 1 feet, forming specimens large enough to investigate seriously upon. These were removed by unscrewing one side of the box and sliding them out. Care had to be taken to oil the sides of the moulds slightly before ramming the mixture in them, to avoid trouble in getting them out.

CONDITIONS OF MIXTURE AND PROPORTIONS.

The proportions adopted for this series were one of cement, two of sand, and four of stones, by weight, the proportion of water being based on the weight of sand and cement.

The cement and the sand were first thoroughly mixed dry, then the water added gradually. The stones were