

MONTREAL.

(Correspondence of THE CANADIAN ARCHITECT AND BUILDER.)

The past year has been of considerable importance in the building annals of the City of Montreal.

There were about eleven hundred (1100) new buildings erected during the year 1887 at an estimated cost of four million (4,000,000) dollars as against six hundred and ninety nine (699) in the previous year. And the highest record during the past twenty three years was in 1871 when there were one thousand and sixty buildings erected.

There is nothing of the "boom" about this large increase but it is the natural result of a demand for increased accommodation.

The current year will certainly show a still further increase, especially in the amounts expended, as there are a number of very important buildings under way.

The first in importance are the two new depots, the C. P. R. and the Grand Trunk, at an estimated cost of three hundred and fifty thousand dollars.

The other important buildings under construction are the New York Life Insurance Company's office on the Place D'Armes, the new Methodist Church on St. Catherine street, and the Technical Schools, the latter being the property of the order of Christian Brothers.

As soon as the C. P. R. depot and offices are completed the present building on St. James street will be taken over by the Imperial Life Insurance Company and three storeys will be added, thus adding another to the many imposing structures on St. James street.

The Mechanics' Institute will be entirely re-modelled at a cost of thirty thousand dollars. A storey will be added and a handsome clock tower will complete what will certainly be a fine building worthy of the institution.

The competing plans for the new Protestant Insane Asylum to be erected between Montreal and Lachine are hung in the Mechanics' Institute. There are five exhibits, and they will be adjudged in the course of this month.

The Building Inspector states that the cost of building materials such as brick, lime, stone and timber, was last year 25 per cent higher than in 1886. Wages also were higher. Carpenters were paid \$1.50 to \$2, painters \$1.75, plumbers \$2, bricklayers \$3.50 to \$4.50, being an increase of about \$1 a day; stonemasons \$3 to \$3.25, being an increase of about 50c.

WINNIPEG.

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Things in Winnipeg and Manitoba generally, are always quiet at this time of the year, and particularly so just now in consequence of the undecided position of railroad and political matters.

The difficulty here is that any one having an idea of erecting new buildings will wait until later on in the year to see what is going to turn up to warrant the outlay, and generally before any decision is arrived at, the season is so far advanced that a great deal of valuable time is wasted getting ready; our actual building season being so very short.

However, the prospects for building are very good this year. All lines of business have been benefited by the splendid crops we have had, and a great number of people have thus been enabled to square up old matters and have cleared the atmosphere as it were, so that new liabilities can be entered into.

Endeavors are being made by both men and contractors to establish combinations in order to keep up prices for labor and contracts generally, but on account of the transient or migratory nature of both artisans and contractors, this will be a difficult matter for some time yet. Men who will take work at any price are continually coming in; and as most people building insist upon the lowest tender being accepted, there is often trouble in getting work finished, and a season often passes before a respectable contractor can get work.

At a meeting of builders, contractors and sub-contractors held in Winnipeg last month, "The Builders' Association" was formed. The Association, which is designed to include all interested in the different branches of construction work, elected the following officers: J. G. Latimer, president; E. Cass, vice-president; J. A. Girvin, and vice-president; J. L. Wells, treasurer; H. J. Raymer, secretary. A committee was appointed, composed of Messrs. J. H. Harris, James Thompson, Murray (of Murray & McDiarmid), and the

president and secretary to draft a set of by-laws.

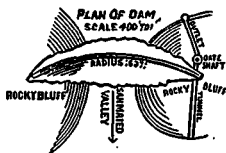
"The Amalgamated Council of the Building Trades of Winnipeg" is the name of another new organization composed of delegates from the various unions in connection with the building trades. The officers elect are: President, B. Nicolson; vice-president, C. Harrison; recording-secretary, W. H. Reeve; financial-secretary and treasurer, T. V. Rutherford. The following rate of wages was approved of: bricklayers, 45c. per hour; carpenters, 30c. and 45c. over-time; plasterers, 40c. and laborers 20c. over-time 30c.

As a natural consequence in a comparatively new country, partly owing to the migratory habits of some contractors, the tenders for works publicly advertised for during the last two years in Winnipeg have been very wide; and in many cases bids have been below actual cost, causing great dissatisfaction among established builders, and loss to those to whom the works have been awarded. In order to endeavor to establish a more healthy basis, the builders and contractors are forming an association by which they hope to obtain a fair price for their work, and shut out irresponsible men. The price of labor in Winnipeg to day is:—Carpenters, \$2.50; painters, \$2.50; labourers, \$1.75; bricklayers, \$4.00; masons, \$4.00; plasterers, \$4.00. Prices of materials:—dimension stuff, spruce \$16.00; dimension stuff, pine \$18.00; drop siding, \$22.00 to \$34.00; flooring, \$22.00 to \$35.00; clear pine, \$35.00 to \$50.00; shingles, \$2.00 to 3.50; bricks @ \$10.50, cement @ \$5.00, plaster @ \$2.75, lime @ 20c. to 25c., nails @ \$3.75 to \$4.50.

THE GREAT DAM AT SAN MATEO.

Our readers have heard of the great dam which is being constructed at San Mateo, Cal., to furnish a water supply for San Francisco. As an engineering work it is exciting notice everywhere.

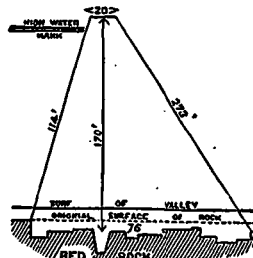
As the system for building the dam is original, a de-



PLAN SHOWING POSITION OF CONCRETE BLOCKS—SCALE 40' TO 1".

Dotted line A. B. C. D., showing approximate position of Block in next layer.

tailed description, may not be found uninteresting. Herman Schussler, the chief engineer of the company, has had charge of the work from the outset. After the excavations which laid bare the bedrock, the most important thing was the manufacture of the concrete. Every thing in this branch of the work was original. An enormous structure, consisting of three platforms, was built



CROSS SECTION OF DAM—SCALE 80' to 1".

on the side hill near the site of the dam. On the upper platform are placed the huge bins for sand, that is hauled in wagons from Northbeach in San Francisco. Near by is the rock crusher which grinds the coarse rocks into pieces no larger than walnuts. The crushed rock then passes into a larger roller, and is thoroughly washed by a two inch jet of water. Cleaned of all dirt it falls into a chute, and is emptied into boxes that hold exactly

twenty-two cubic feet. These boxes are on wheels, and when one is ready to be emptied there are brought at the same time on tram cars one barrel of Portland cement and two barrels of sand. In this proportion they are emptied into a chute, which leads to the mixer on the third platform. On this platform are ranged the three engines that furnish the motive power for all the work. They are detached, so that any accident to one does not retard the work of the others. The mixer is made of 5-16 boiler-iron, in shape like a cube set askew. This revolves and thoroughly mixes the material, and the concrete falls into carts that are run on a big platform out over the dam. Each carload is dumped into large pipes and falls to the level of the dam, where workmen wheel it to the place required. The capacity of the concrete machines is 450 barrels per day, each of twenty-two cubic feet, or 10,000 cubic feet of concrete. No description can give any idea of the ingenuity with which time and labor have been saved here. Everything runs like clock work, and the plan of using barrels instead of box-cars saves an immense amount of rehandling of material.

Down at the dam the same originality and ingenuity are shown. The blocks of concrete are laid on the following plan: After the bedrock is carefully cleaned and all moisture gathered up by sponges, the work of laying a concrete block is begun. First is made a framework of wood of varying sizes, twenty feet or less square and six feet thick. Into this the concrete is dumped from wheel-barrows. Men with shovels spread it even, and stamp it down with heavy iron rammers. When this framework is filled it is covered even with boards, kept wet to prevent rapid evaporation, and allowed to dry from seven to ten days. At the end of that time the concrete in the bulkhead is as hard as rock, and tests have shown that in moving it does not scale off from the foundation, but it brings away the solid bedrock, of which it has actually become an inseparable part.

The sections of concrete are all laid with reference to a common center, indicated by a flag. In all other dams of this kind the concrete is laid as a monolith in large blocks covering the entire area. Mr. Schussler's plan has been to break joints with every block of concrete. The dimensions of the dam are: Height, 170 feet; width at base, 176 feet; width at top, 20 feet; slope on water-side, 1 foot horizontal to 4 feet vertical; slope on the lower side, 2 feet horizontal to 3 feet vertical. The area of the reservoir is 1,800 acres; storage capacity, 32,000,000,000 gallons; elevation above tide, 300 feet.

The arrangements for drawing water from the reservoir are peculiar. A shaft 14 feet clear of brickwork is sunk from the rocky bluff on the water side of the dam which is tapped by four tunnels from the reservoir side. At the point where each of the four tunnels joins the reservoir it will be provided with a movable iron screen. At the point where each of the four joins the shaft it will be mounded with a 44 inch water gate. Each tunnel is 35 feet above the other. All these four gates connect in the shaft with a vertical cast-iron pipe, 50 inches in diameter, which again at the base of the shaft has an elbow that leads into the main outlet of the tunnel. This is 7 feet 6 inches clear of brickwork, through which the 50 inch pipe is to run and connect with the 44 inch pipe that leads to San Francisco. At the outlet of this latter tunnel, which has a length of 306 feet from the shaft, the main regulating gate will be placed in the 30 inch pipe. The four gates mentioned in connection with the main shaft are intended to allow water to be drawn from different levels of the reservoir. An iron winding staircase will be constructed in the shaft to admit of easy access to the three gates. The top of the main shaft will extend 10 feet above high water mark.

The direct water shed of this reservoir is 24 square miles, but it is so situated that it can receive the waste waters from the adjoining San Andreas Reservoir, as well as from Pilarcitos, both of which are in the neighborhood and at higher elevations than this. The company proposes to make this Lower Crystal Springs Reservoir the receptacle not only of direct and immediately adjacent water sheds, but also of the water shed of San Francisco Creek, which has an area of twenty-five square miles, the Pescadero and San Gregorio water sheds, which have a combined area of fifty-five square miles, and eventually that of the Calaveras water shed, which lies on the east side of San Francisco Bay, and which has an area of 140 square miles. In order to connect the San Francisco water shed with this Crystal Springs water shed a tunnel five miles long and eleven feet clear in diameter is to be constructed, while it will take an additional five miles of tunnel to bring in the Pescadero and San Gregorio water shed, and a two mile tunnel and twenty two miles of pipe to connect the Calaveras water shed.