

worker in anything tending to advance the interests of the plumbing trade. Although a young man, he has been past master of the A. F. and A. Masons since 1883.

A correspondent sends the ARCHITECT AND BUILDER the following communication regarding the London Association :

The greatest enthusiasm prevails in association matters in London. All the manufacturers have signed the Montreal resolutions, and there is every prospect of a new era in the plumbing business in this city. If some bright and sparkling genius could unfold a plan whereby a profit could be obtained upon work, he would be a benefactor to a trade that gets from the public the name of getting rich on each job let, yet the fact remains that it is one of the most difficult operations to make money out of the plumbing business. If the public were educated to discriminate between good plumbing and bad it might be different, but in cities the size of this the process is exceedingly slow.

We hope, however, that the coming year will see a good practical plumbing and inspection by-law enacted, that must prove beneficial to the best class of plumbers ; and if it drives the other class out of a business requiring only the best ability, the result would be a great gain to the citizens as well as to sanitary science in its relation to plumbing. London Master Plumbers' Association will always be found in the foremost rank.

THE UNDERPINNING OF HEAVY BUILDINGS.*

BY JULES BRENCHAUD.

THE writer refers to the great difficulties experienced in preventing injury, by settlement of heavy buildings, when it is necessary to excavate and build on the immediate adjacent building site.

The specific case treated is of a building which was to be carried 30 feet (2 storeys) below the street level, over one-half of which had to be made water-tight, as it was below water level. The total depth of foundation being 45 to 50 feet below the sidewalk, these foundations consisted of close fitting rectangular pneumatic caissons all around the exterior of the new building site and cylindrical intermediate ones for columns.

As every square foot of the property had to be built upon, the problem was to pin the adjacent buildings up during caisson sinking and construction periods. This was accomplished by placing vertical cylindrical iron columns in slits in the walls, extending from the foundation upwards. These were founded at the bottom on rock or very hard hard-pan, and at their tops the bearings were spread out by transverse horizontal slits in the walls, in which were placed nests of I beams on top of the columns.

The cylindrical columns were 10" to 30" in diameter, the smaller ones being forced down by a 60-ton hydraulic jack, in sections 5 feet long at a time, to proper bearing ; some also were partially sunk by water jet. The larger ones under the heavier building were sunk by compressed air, as neither the water jet or jack would force them through a layer of hard pan to the rock.

The larger columns were first made of cast iron, but after one becoming injured by forcing past a boulder, the rest were made of rivetted steel sections.

These columns were filled, after sinking, with Portland cement concrete.

The writer then details several similar cases where the application has been successful, and concludes by stating that while this method is not (evidently) of universal application, it will be found the best means of transferring the load of an adjacent building to a lower foundation with a minimum of obstruction to the building site about to be used ; also, that as these underpinnings are left in place, there is no danger of that slight subsidence which takes place when other kinds of temporary underpinning are removed.

*Reference before the Can. Society of Civil Engineers to Proceedings Am. Soc. C. E., Vol. XXII., Dec., 1896.

THE DUTY ON BUILDING MATERIALS.

BEFORE the Tariff Commissioners at Montreal Mr. W. C. Trotter, president of the Standard Drain Pipe Co., of St. Johns, Que., asked that the present duty of thirty-five per cent. upon drain pipes be maintained. Any reduction, he claimed, would be detrimental to the Canadian industry.

Mr. F. B. Dakin, representing the pottery works at St. Johns, asked that the duty on all white Rockingham and cane ware be replaced to 35 per cent., as it was before the last revision ; that the duty on all printed, decorated, and china ware be advanced to 40 per cent., and that all raw material be admitted free. It was pointed out that if there was no change in the duties a French company would invest more than a million dollars in the works, and manufacture fine pottery on an extensive scale. The deputation also complained about improper valuation, and suggested that expert appraisers should be appointed by the Government.

The first representative of the cement industry was Mr. Thos. M. Morgan, who desired the present duty to remain. There were three manufactories in Canada, producing about one-fourth of the cement used in the country, but he thought there was no reason why Canada should not produce all the cement required for home use. Mr. Wm. McNally, representing cement importers, submitted the following statement :

Of the total importations of this article about 25 per cent. comes from Belgium and 45 per cent. from England, in casks weighing 350 lbs., 375 lbs., and 400 lbs. gross each. During the year 1895 the total consumption in Canada was about 255,000 casks, or, with the Government requirements, 282,000 casks, of which quantity over 223,000 casks were imported. The present duty is 40 cents per cask, specific. The standard weight of casks is 375 pounds gross. Extra duty is charged proportionately on 400 lbs. casks, but no allowance is made from the duty of 40 cents on 350 lbs. casks. The present sterling f.o.b. values range from 3s. 2d. per cask of 350 lbs. on good Belgian cements to 5s. 1d. for 375 lbs. casks in high grade Belgian and English makes—making present specific duty of 40 cents per cask equivalent to 33 per cent. to 52 per cent. ad valorem. This present duty was initiated March, 1886, the duty previous to that date having been 20 per cent. ad valorem, or equivalent to from 22 to 30 cents per cask on the sterling costs at that time, and to from 16 to 25 cents per cask on present sterling costs. Owing to improvements in process of manufacture, and more economical cost of production, the sterling costs of cement have been so reduced since 1885 that the advance from 20 per cent. ad valorem to 40 cents per cask specific, instead of being an advance of 35 to 85 per cent. in the duty (as it was at that time), now represents at present sterling costs an advance of from 60 to 150 per cent. over the 20 per cent. ad valorem duty. We submit that the present duty is abnormally high and unwarranted, and we petition for its reduction to a more reasonable and equitable rate. Such reduction would bring about a much larger consumption of Portland cement in Canada, replacing lime and other inferior mortars in Government and municipal public works, railway and bridge, and general building construction, thus raising the standard of such works to the level of similar classes of work in Europe and the United States.

On behalf of the New Rockland Slate Co., Mr. T. B. Bacon, secretary-treasurer, presented the following facts, requesting that no reduction be made in the present duty on slate :

The present duty on black roofing slate is 30%, but not to exceed 75 cents per square, so that the duty is 30% only on slate selling at \$2.50 per square or less, which is of the lowest quality. On some of the better qualities of American slate 30% would give a duty of \$1.50, were it not for the specific limit of 75 cents per square. On roofing slate other than black the duty is 30%, but not to exceed 90 cents per square ; on red roofing slate, for example, the price is as high as \$8.50 to \$10.50 per square, on which price 90 cents is only a duty of 8 $\frac{3}{4}$ % to 10 $\frac{3}{4}$ % ; "Sea Green" slate, which does not keep its color, is the cheapest produced, and the higher duty was put on this to stop its use in Canada.

We ask that the duty remain at not less than 75 cents per square on black roofing slate and 90 cents per square on other qualities, as we cannot compete with the low grade slate produced in the United States. Slate produced in the United States of quality equal to ours realizes as high, and in many cases a higher, price at the quarry in the United States than ours in Canada.

The duty on slate slab work is also 30%, and we ask that no reduction be made in this, as our slate, being tough and solid, is much more expensive to work into shape than the soft American slate with which we have to compete ; and the extra cost is warranted, because, being tough, solid and non-absorbent, it is far superior to the soft and porous American slate for sanitary and similar work, in which it is largely used. Our slate compares with American slate very much as hard wood compares with soft, and its extra cost is all in the labor expended upon it.

We present herewith copies of and extracts from several letters from users of slate, who also state that they do not wish any change to be made. You will note that the Mr. Ferguson referred to in these letters is the Canadian agent for United States quarries, and naturally desires a reduction in the duty in Canada, on which his business depends.

We may say that the village of New Rockland, Que., has been built up and is entirely dependent upon the slate quarry for its existence, and the closing of the quarry, which a change of duty would bring about, would depopulate this village municipality and shut off the local market for farm produce which the village affords.

Canadian patents have recently been granted to J. M. Gander, of Toronto, for plaster board material, and to J. S. Jackson, and F. J. Travers, for steam and hot water radiator.

As the result of a conference between the special committee of plumbers appointed at the Quebec meeting and the Toronto wholesale dealers and manufacturers of plumbers' supplies, the latter have signed the agreement adopted at the Montreal convention last summer relative to the sale of goods to legitimate members of the trade. This, it is hoped, will result equally beneficial to both manufacturers and plumbers.