A few of the up-to-date municipalities have adopted Canadian Society Specifications but others are extremely lax in this regard. The latter cases are more marked in this regard, as their engineers are prominently connected with the Society. Of course, in any such argument a case against existing specifications is always demanded and because of the lack of definite information, one is often at a loss what to advance other than the all important argument of the desired standardization throughout Canada. But if engineers will enquire into the actual conditions of manufacture and inspection, it will be found that the specifications of certain municipalities err too much on the side of lightness in certain sizes, the thickness and weights specified being good only if the pipe is perfect, but if the allowable variation in thickness be deducted, it is seen that there is really too small a margin of safety for certain errors which cannot be caught by any method of inspection. This is a matter that demands the attention of all who have to do with the buying of cast iron water pipe. If the reader is one of these, we woudld suggest one question: Do you use Canadian Society of Civil Engineers' Specifications?

EDITORIAL COMMENT.

The Boston Insulated Wire and Cable Company is to establish a branch factory at Hamilton, Ont., about September 1st, and have purchased the land of the Dominion Axminster Company.

No time was lost in commencing the new C.P.R. depot at Brandon, Man. Contract signed one day; operations begun the next.

THE EARNING POWER OF CHEMISTRY.

At the recent meeting of the American Chemical Society in Indianapolis, one of the main features of the sessions was the public lecture by Arthur D. Little, of Boston, on the earning and waste-avoiding power of chemistry, and its services to modern industry and the comfort and convenience of modern life.

To-day, he said, the United States alone is richer by $30,000,000 a year by Kirchof's discovery that starch could be changed to glucose. The improvements in incandescent lamps during the past ten years had saved $24,000,000 a year in the cost of lighting. The cost of lubrication in manufacturing plants has been cut in two. Pointing to our waste of materials, Mr. Little declared that of our annual coal bill of a billion dollars, chemistry could easily have saved a million dollars. Especially striking from a man of Mr. Little's long experience with every side of industrial chemistry, was his support of Harrington Emerson's estimate of the waste on American railroads. On this point he said:—

"A few of us have been surprised and none more than the railway managers themselves, by the well supported statement before the Interstate Commerce Commission that the railroads of the country could save $300,000,000 a year by the application of scientific management to the operation of their properties. Every chemist who has studied the problem is well aware that the entire amount in question could be saved through utilization of the proved results of chemistry alone."

FLOW THROUGH LOCOMOTIVE WATER COLUMNS.

A recent bulletin issued by the University of Illinois deals very thoroughly with the resistance to flow through water columns used by railway systems. The summary of the work is as follows:—

1. The tests give the loss of head for various rates of discharge in the principal types of locomotive water columns in use in the United States. The loss through the valve and through the riser of the water columns were each determined.

2. At a discharge of 4,000 gals. per min. the loss of head through the water columns ranged from 15.4 ft. of head to 46.5 ft. of head. The resistance to flow is surprisingly high—much higher than has usually been estimated. It is evident that the discharge of water columns under working conditions is smaller in many cases than has been estimated. It is worth noting that the water columns which give high resistances, include types which are used in large numbers by the railroads of the country.

3. A comparison with the frictional losses through pipes and elbows will help to give a fuller conception of this high loss of head. For the water column which gave the highest resistance, the loss of head is equal to the frictional loss for the same discharge through a 10-in. line of straight pipe 566 ft. long. Similarly this loss is 25 times as much as that through a 10-in. elbow.

4. An examination of some of the types shows that the forms of the valves and passages do not accord with the principles of good hydraulic design. Sudden change in direction, sudden contraction and expansion of the section of the stream, and tortuous passages are among the objections to be found, and high local velocities are especially troublesome. Mechanical features of construction, inspection and repair seem to have crowded out consideration of hydraulic efficiency.

5. The telescopic adjustable spout with its large cross section shows lower losses than the fixed spout, though it must be borne in mind that the point of discharge taken in water columns with telescopic adjustable spouts is at the end of the riser, and that for this reason the lift is greater than with the fixed spout. The ball and socket spout gives about the same friction loss as the rigid spout, but it has the advantage that the point of discharge is usually lower. It may also be noted that the anti-splash devices use up head in providing a solid stream.

6. The maximum velocity allowable through a water column will depend upon such matters as the satisfactory operation of the valve and also upon the effect of closing the valve in the development of water hammer in the supply main. With a short line from the supply tank a velocity of 12 or 15 ft. per sec. through the water column may be considered as the maximum desirable velocity for ordinary conditions, and for longer lines the limiting velocity may perhaps be as low as 8 ft. per sec. It would seem that 3,000 gals. per min. for an 8-in. water column, 4,000 gals. per min. for a 10-in. water column, and 6,000 gals. per min. for a 12-in. water column may be considered to be the limit of desirable discharge. It would seem that for the rates of discharge just noted the allowable loss through the water column itself should not be much more than 20 ft., and that the limit may well be placed at less than 20 ft.

7. The method outlined for making calculations of the losses of head and discharge in water service installations is a convenient one. By means of diagrams for friction in pipe and elbows and for loss through the water column and the use of the trial ratio, the discharge given by any flow