

MUNICIPAL DEPARTMENT

THE USE AND WASTE OF WATER.*

The most reasonable and practical basis of computation for the amount of water used appears to be to consider the number of miles of distribution in connection with the number of taps or separate connections supplying buildings.

The mileage of main pipes enters as a factor into the public use of water for street-cleaning, fire protection, sewer-flushing and like purposes. Such use is governed almost entirely by the length of pipe laid and not by the population.

Underground leakage.--There is much leakage underground from bad joints, breaks and defective stoppage of disused services. There are, on the 850 miles of mains in New York, at least 18,000 old service taps which have been discontinued and more or less imperfectly plugged up. Thousands of them are leaking continuously; some but a mere dribble, but others carrying off into the subsoil and into the sewers thousands of gallons daily each. If the underground channels become obstructed, the water will rise to the surface, and the leak will be reported. Every increase of pressure in the pipes increases the leakage from these old taps, and attention is called to them. The number of leaks which showed themselves, when the pressure on the mains was kept down on account of scarcity of water between 1883 and 1889, was about 700 annually. After the new aqueduct was finished, and the pressure was increased, the number reported was over 1,000 annually; and last year, after the full pressure had been turned on down-town, there were 2,500 such leaks that made themselves manifest. In the basements of buildings, and in vacant lots lying below the surface of the street, and on the surface of the street itself, anywhere in the lower part of the city, springs may be noticed by an observer every day which are caused solely by leaks in the service pipes and the mains.

The mains themselves also leak largely. There are at least 500,000 joints in the main pipes underground, and from many of them water is escaping. Indeed, instances have occurred in which the excessive amount of water encountered in the excavation of a pit in the street has been traced to a joint in a main water pipe which had never been leaded at all by the contractor, and from which several hundred thousand gallons a day had been flowing for years into a sandy sub-soil and been carried off by the sewers. Cases of leakage are constantly occurring in which the source is

Extracts from a report by Mr. James J. R. Croes, M. Am. Soc. C. E., to the Engineering Committee of the Merchants' Association of New York.

traced to corroded cast iron mains. For several years the average amount of old pipe which had to be taken up and replaced has been about two miles annually, but the deterioration and consequent leakage from the old pipes is progressing more rapidly than the work of replacing the pipes. These sources of consumption of water are manifestly entirely independent of the population of city, but they do bear a definite relation to the length of pipes.

Water used for public purposes.--The quantity of water used for public purposes cannot be accurately measured. No effort has ever been made in New York to determine this amount, but in a few American and a large number of foreign cities, particularly in Germany, very careful investigations have been made, which show the average quantity of water thus used to be not far from five gallons a day per head of population. As before stated, this basis of computation in the case of such a city as New York does not appear to be reasonable, for the use of water for public purposes depends more upon the length of streets in which the water is used than on the number of people who reside on those streets and on other streets unsupplied with water. From a comparison of the various records obtainable, both in this country and abroad, I think that a

fair basis of estimation of water used for public purposes is 15,000 gallons per mile of main pipes.

Official meter records.--For nearly twenty years the records of the amount of water measured by meters were in charge of the chief engineer, and in his report for each year from 1880 to 1891 there was published a very valuable analysis and classification of the character of occupation of the premises to which meters were applied and the quantity of water used per day by each of such consumers. The larger consumers were metered first, and, as the number of metered premises increased, the average consumption of water through each meter decreased until 1887, since which time it has been a constant quantity. After 1891 the chief engineer was relieved from the duty of making a classification of meter records, and none has been made, except in 1894. The quantity of water which has been used by the meters since that date I have computed from the reports of the Water Registrar, which shows the number of meters and the revenue derived from them each year. It appears from these records that the daily consumption of water per metered tap since 1888, when there were 17,750 metres in use, up to the present time, when there are 36,068 meters in use, has averaged 1,450 gallons a day.

(To be Continued.)

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