

**COMMUNICATION TO THE  
CITY COUNCIL, ON THE  
SUBJECT OF INTRODUCING  
WATER INTO THE CITY**

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Communication to the City Council, on the Subject of Introducing Water into the city by  
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## CITY OF BOSTON.

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*Gentlemen of the City Council.*

The 12th Section of the City Charter enjoins it on the Mayor to communicate, for the consideration of the City Council, such topics and matters as may seem to him to be deserving of the notice of that Body. Equally on account of its extreme as well as its paramount importance, it is, in my judgment, incumbent on me even at this early hour, to recommend to your grave attention the subject of bringing an ample supply of pure and fresh water into the City of Boston.

The wells now in Boston may be divided into four general classes. The first is the surface or top water well. These wells are supplied by the soakings or top water. They are found in a layer of sand or of gravel and sand, resting on the body of clay, which constitutes the proper foundations of the town. They seldom exceed twenty or twenty-four feet in depth, commonly yielding good water, for the most part less hard or brackish than the general character of the City Water. But it is evident that, as the surface of the ground becomes covered with buildings and as the streets are more generally paved so as to allow the water to run off, the supply of these wells will diminish and as excavations increase and are crowded into narrower limits, the quality of

the water will degenerate. This class of wells, being probably about one in ten in the whole town, is necessarily much affected by impurities that soak and filter through the soil.

The next class, embracing the greater part of our wells, is that which is found under the first bed or pan of clay. Their depth varies exceedingly, running from 80 to 100 feet on the eminences, and on the flat parts of the town from 30 to 40 feet. The pan, below which the water is found, consists of a hard clay of a bluish cast, mixed with loose stones, generally of a small size, though occasionally one that requires a blast. In the language of geology there are no rocks on the peninsula "in place," with the exception of a variety of gray slate, which is met with at a considerable depth, running apparently from a point near the Massachusetts General Hospital, along the Mill Pond and towards the North End. The general nature of the soil or formation can easily be seen by looking at a section of Fort, Copps or Beacon Hills, cut down where new streets are building.

The bed or pan of clay itself contains no water but flaws or spits of sand that follow the dip or pitch of the ground. I am led to think that these wells, whether on the high or the low land, are supplied from the same stream or under ground brook. This stream appears to enter the town on the north, spreads under the water proof covering of clay I have mentioned, finally discharging itself somewhere into the salt water. I infer that the head in the country is not high from the circumstance, that the water seldom rises in any of our wells more than eight or ten feet. The stream generally circulates in a layer of



sand of a sharp grit, though also found in gravel. When first reached, this sand appears hard and solid, much like the beach of the Sea, but upon being opened with a bar or pick axe soon becomes loose, the water penetrating it freely. This water is hard or brackish, containing common salt and a portion of calcareous matter (Paris Plaister) dissolved ;—these impurities being in considerable quantities as is evident from the deposit copiously and readily made on a Tea Kettle. I have now in my possession a piece of crust, nearly a fourth of an inch thick, taken from the bottom and side of a common boiler where it had been suffered accidentally to accumulate. This deposit was made in forty-three days. There was water constantly in the boiler, though probably not always in a state of evaporation. The well, from which this water was drawn, is on an estate, that has been occupied at least a century.

The water of this class of wells derives its salt impregnation principally, I presume, from the bed or layer of sand and gravel in which it stands or circulates. That this stratum was once steeped in the sea water seems evident from the fact that at the bottom of wells, beach or tide-worn pebbles often, and clam and oyster shells occasionally are found. Shells of this sort have been seen in wells on Copps Hill fifty feet below the surface.

Many of these wells (probably more than is imagined) are affected by the tides. It was ascertained by a course of experiments about thirty years ago that the well on Beacon Hill in the State House yard fell and rose with the ebb and flow. This well is nearly 100 feet deep. It is in my power to recite many other facts of the same kind ; but for the

present I shall confine myself to one. When the walls, enclosing the present Mill Dam, were completed and the water withdrawn from what is called the empty basin, a great number of wells, east and south east of the Common, were dried, but on sinking them six or eight feet, water was again found. It is, therefore, evident that whether the stream, which passes beneath the town, discharges itself into the salt water above or below low water mark, the stream itself will be more or less backed when the tide rises.

Fresh water is also found in a stream that appears to pass under the pan of the harbour, water having been found by boring through clay on an average from 80 to 120 feet both on the Mill Pond and a part of the Mill Dam flats. Very good water in some of the low parts of the town is also drawn up by means of a hollow log, first passing below two layers of clay and two of a black sand drenched with salt. The two last classes of wells are, however, not numerous.

The water in the sand or gravel (or the top water wells) must degenerate as impurities are collected on or under the surface, but the water under the clay, which is really impervious, ought to improve for the substances, that impart to it hard or brackish qualities, are yearly more diluted. Still, many foul matters undoubtedly and unavoidably penetrate into these wells and gradually drain and drip to the bottom.— On the whole, there is abundant reason to believe that the well water in the City, has generally speaking, become worse and from causes unavoidable, wherever a large and compressed population is assembled. I believe it also to be true as a general

remark that the supply in the old parts of the town is inadequate, and that in the new, more especially those over which the population will soon spread, it is now exceedingly difficult (and of course will always continue so) to procure tolerable water even in limited quantities and at a great expense.

In the memory of many persons, even those little advanced beyond the middle age, there existed in different parts of the City, copious and flowing springs of soft water, that have either become hard or of which no trace now remains. But some portion of this water has undoubtedly been drawn off into the private wells that have been built in the neighbourhood, for as the water under the clay must come from a distance, it is not easy to understand how the absolute quantity on the Peninsula can be diminished by any use there. The supply, indeed, may be intercepted by an increase of population in Charlestown or other towns near this, for it is a matter susceptible of immediate proof that a well, on the other side of Charlestown Bridge was dried in a very brief space by another sunk at the north part of Boston.

Another great and general supply of water is from cisterns. Little need be said on this head. This description of water unavoidably degenerates in proportion to the increase of population. Not only a greater accumulation of soot, especially where the English or bituminous coals are used, takes place on the roof of houses, but dust and other foul matters blow up from the streets and lodge or collect in the gutters and stain and contaminate the water. Particularly after a sudden and heavy shower or the melting of snow, when the coal smoke that had rested upon it, descends immediately with the water