LOOK to the FUTURE

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Looking to the future is a vital necessity for the manager of a water utility. He must know, for example, if a proposed extension will be adequate, not only for the immediate requirements, but he should try to be clairvoyant, and know what is planned in that vicinity in the next twenty five to fifty years.

We can assume that a manager or engineer takes over an existing system, established during the latter half of the 19th centnry, as were most water works systems in Maine. In those days, industry was largely concentrated along the rivers, and depended on them for water used in manufacturing, using the local supply, if any, mostly for drinking water only, and possibly to suplement their own fire protection facilities.

On the other hand, many town water systems were based on the mill supply, with local domestic water supplied by the mill, as a sideline. The residents had to be content with the quality and quantity of water which the mill system provided, frequently inadequate in quantity, and of poor quality from any viewpoint, taste, odor, clarity, sanitation or pressure. There are a few of these systems

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still in use, as the town's only water supply.

In the larger cities and towns, the public supply was provided as the concentration of individual wells and cess pools became so dense that it was impossible for anyone to get a safe pure water for home use, and groups of local citizens formed companies to acquire works for that purpose alone. Many miles of main pipes were installed of 4", and smaller, diameter pipe, adequate to a certain extent for domestic use, but rarely of value for fire protection, or industrial requirements.

Even sources were inadequate. Small ponds near town were used, or a stream running through the town might be dammed up just above the town, and a small pump installed, pumping into a still smaller reservoir on a hill top, or a wooden tank near the town center.

Then came the great expansion of industry, with its accompanying trend toward urban living. More people came to town, leaving the farm to work in the mill, store, factory, state house or other government institution, and they wanted to live near their work. They had to, because the automobile had not yet arrived on the scene. A few trolley lines ran between cities, and people began building homes within walking distance of the car line.

This created a problem of water supply. For example, the road

between Augusta and Waterville, before the days of the A&K Railroad, was a dirt road, with scattered farms, each with its own water supply.

Came the trolley in the early 1900's, and people moved out of town. Then the road alongside the trolley track was improved, so that the people could use their newly acquired cars, abandoning the trolley car, which eventually disappeared. With the imppoved highway and better cars, more people moved to the country.

What to do for water??? Call on the Augusta Water District, of course, and the Augusta Water District gradually followed dwellings North, a quarter or a half mile at a crack, with six inch pipe; four miles of it, with a hydrant every thousand feet.

Here we go! City water-- more houses. More houses created a demand for hydrants, with accompanying lower insurance rates. Still more houses, with more people living in them. With more people, some families with two or more cars, the road became inadequate, and a better road was built, and still more houses, more people, more cars! Still our little old six inch pipe supplying them.

When the better road was built, four years ago, new standards required better grades, flatter curves. Where was our poor little six inch pipe? Largely right smack in the middle of an old road, mostly built on solid rock.

It cost us $80,000 to make a start on keeping up, relocating our enlarging service pipes, etc
main where grades were raised or lowered. Where pipe was re-located, we put in 10" pipe, way out on the shoulder, and moved hydrants back even further. Still service is good for residential use only, and the firemen can get one ~~good~~ fairly good or two not so good hose lines on a fire.

At least we are in a position to improve service in this area, by filling in the gaps in the 10" pipe, and building standpipes on a couple of good locations available when needed.

The spokes of the wheel of which the State House is the hub all follow a similar pattern, Northeast, Southeast, South, West and Northwest. Plans are on the boards right now for improvements as needed, and as they can be financed.

That is the story in the distribution system. What of Supply? and Treatment? Before 1905 Augusta used water from the Kennebec River!! The saying is that you could always tell when asparagus came on the market in Waterville. Typhiod fever was epidemic. Something had to be done, and was.

In 1904
A water district was formed, a corporate entity envisioned by
before 1900
the late Harvey D. Eaton of Waterville, and since copied nationwide, not

only in water supply but schools, sewers, ports, irrigation and even parking of automobiles.

The trustees of the Augusta Water District searched for a new supply. With all the lakes in Maine, it is not always easy to find one suitable for a water supply. Several were investigated and passed up as being too far away, too low in elevation, too small a drainage area, poor quality of water etc. One was found nine miles from town, higher than the highest part of Augusta and of good quality, but with only two and one half square miles of water shed. Those far seeing men selected Carleton Pond in Readfield, built a pipe line large enough to provide gravity flow to a reservoir, 275 feet above the business section, and less than a mile away. As the pipe line passed by Lake Cobbosseecontee, they built a pumping station on its shore, with a pump to take its water in case Carleton Pond was inadequate. In the pumping station, also, they put two pumps which would boost Carleton Pond water a little faster to town.

This was in 1906. From then until 1942, the Cobbosseecontee pump was used only once, when a break in the line from Carleton Pond, combined with a dry year in 1911, practically drained ~~Carleton~~ the Pond.

Even then the booster pumps were adequate until 1928. A combination of growth of the city, and normal reduction in thw carrying capacity

of the unlined cast iron pipe, made necessary the installation of a larger pump. A still larger pump was installed in 1952.

Steady growth of the city, and higher standards for fire flow, indicated more distribution system storage, and in 1926 the in-town storage was increased from three days' supply to eight days'. Since that time, increased use has reduced the reserve to about 5 days'.

Note the time intervals between major additions: 1906 the new supply, only now tending to become inadequate. Pumping capacity was increased in 1928 and 1952, storage added in 1926, which is still adequate in general, with additional storage being required in the outskirts, as the system grows in area.

The day approaches, fifty years later, when an additional supply and transmission facilities are needed. These are in the survey and design stage now. I hope they will be good for another fifty years. I don't expect to know the answer to that one.

I spoke of the inadequacies of the spokes of the wheel. That is true, but twenty five to fifty years ago, who could visualize the increasing trend toward suburban living, and decentralization of industry, and commerce? That trend is upon us, and we must plan as best we can. Facilities toward the suburbs must be planned, not

for immediate needs only, but with the idea in mind that even greater expansion may come.

When we expand to new areas, we must put in a main one or two sizes larger than we think nesessary, keeping an eye out for storage locations, either elevated tanks, standpipes on higher elevations, or even a good well field, or a stream or pond that can be adapted for additional supply.

If a main proves too small, we find that strategically placed elevated storage is more economical than replacing mains with larger ones. They, that is the standpipes, can be designed to fill themselves in periods of low demand, possibly with the help of small booster stations.

We may find our in-town grid systems are overloaded, as apartment houses are built, or commerce and industry relocate from the centers. Even our residential areas demand more water, as home appliances are developed, along with the habit of more baths per week, more bathrooms and flush closets per family unit, as living standards rise with the economy.

These inadequacies may be relievd by installation of trunk feeder mains into an area, much as a turnpike or super highway brings more people to the center of the state.

The Maine Turnpike will make it easier for vacationers to get further into Maine, industry to transport its raw materials, and finished products. More commerce and industry-- more people, more houses, more water required, for all classes and uses.

We must consider, besides more gallons of water, better quality of water. In the early 20th century, if water was clear and tasteless, it must be good water. Perhaps it was, but the Kennebec River proved not so. Cobbosseecontee were clear, tasteless and good, but still not good enough to be used without treatment. Health standards improved, and better techniques in examining the quality of water were developed. It was found that the best appearing water could transmit typhoid fever and other ailments, which the simple filter could not remove, as it would the turbidity and debris, common in stream waters.

Chlorine, and other chemicals, became a necessity, removing all danger of water borne disease, taste, odor, many chemical and organic substances detrimental to the quality. Water can be, and is, very corrosive to certain metals. Customers may demand that it be made softer, thus requiring less soap in the laundry, though that demand is not common in New England. It must be made less corrosive, to lengthen the life of mains and plumbing. Treatment plants become a necessity, ranging from a small crock of a simple chlorine solution, to the elaborate

and costly filter plants, such as Bangor's, which adds chemicals to the water for various purposes, chemicals many people have never heard of.

The more elaborate the plant, the more costly to build and operate. Operating costs may range up to 40% of the gross revenue of the system. These treatment plants must also be expandable, with reserve capacity to meet any emergency of extreme demand, or breakdown of one or more of the facilities.

Who pays for all this planning, construction, operation? Any water utility has one source of revenue, and one source only, its customers. Every individual resident in a community pays a part of these costs, whether he lives in a rented room and eats in a hot dog stand, or owns the most palatial home, or operates the largest industry in town. He pays, if the water system is a municipal department supported by taxes. His tax bill, plus his water bill, or his weekly rent, cover the annual cost of supplying him with water. He pays, if it is a district, entirely self supporting, through water rates only.

Only minor plant additions, as a rule, may be made out of current income, as the Public Utilities Commission regulates rates, and does not approve of large expenditures out of current income. Such projects as trunk mains, additional storage or supply, or long extensions to

new territory, are usually paid for through the issuance of bonds.

Such an issue must be studied with care. In addition to the annual interest payments, some provision must be made to retire these bonds within the life of the project for which they are issued, through a sinking fund, or serial feature in the bonds themselves.

A project such as a new pumping station, filter plant, and so on, may involve additional yearly operating expense. All these features must be taken into consideration in planning the project.

First, is the project essential, or desirable, for the community? Then, can the community pay for it, in addition to regular operating costs and fixed charges, and plus another major project envisioned for the near future, which may require still another bond issue, with its own interest charges, sinking fund, and special operating expense?

All these features must be weighed against current or prospective income, whether derived from water rates, or taxes. This is a subject in itself, and will not be discussed here.

Any water utility, in a community that is not stagnant, must always keep an eye on the future. Its manager, superintendent, engineer, or whatever the chief operator may be called, must always look ahead. Directors or trustees are usually men of vision and buisness ability

from the community, seldom trained, or informed on technical matters. They depend on the judgement and foresight of their manager, must look to him for recommendations. Frequently, and usually, they can see long range trends in the community, perhaps better than the manager. Together, manager and directors make a good team in planning and financing. There must be team work among them, and complete confidence in the abilities and sincerity of each.