the hope that a net financial profit can be obtained by the use of the Miles acid process, unless with sewage of exceptionally high grease content and low alkalinity."

One may rightly question the values of any conclusions based on pre-war prices, because the present evidences indicate that the prevailing prices will not be lowered immdiately, and they may never reach their pre-war level.

TABLE 8—ESTIMATED FINANCIAL RESULTS OF OPERATING THE MILES ACID PROCESS AT THE CALF PASTURE

	Per Million Gallons.
Revenue:	
From tankage	$ 13.59
From grease	34.00
Total gross revenue	$ 47.59
Expenses:	
Estimated cost of treatment	42.75
Profit on above basis	$ 4.84

This is particularly true of labor which is the principal factor in the costs of materials. At present high prices it seems as if the Miles process would be profitable at Boston, and this favorable condition would gradually disappear as the rate of fall in prices exceeding the rate of fall in cost of operation comes into effect.

The materials produced are fertilizer and grease, and it does not seem likely that the demand will decrease rapidly. The materials used for purification are sulphur, pyrite, nitre cake and the sulphur acids. The war has stimulated the production of all these materials, and now that the abnormal demand has ceased they should be cheap.

Therefore we feel that in many cases it is likely that the Miles process might be operated at a slight profit for some time to come, and, in any event, operated at a cost lower than that for any other process producing the same grade of clarification and disinfection.

Other Advantages of the Miles Process

In addition to the advantage due to the freedom from nuisance, the stability of effluent and sludge, and those due to the compensating value of the recovered products, there are still other advantages which should be reckoned with.

Sanitary Efficiency a Necessary Concomitant

All are aware that modern sanitary engineers are designing sewage disposal works to purify sewage to the degree to which the body of water into which the effluent is to be discharged demands and as the financial conditions will allow. In so doing they often sacrifice a desirable degree of clarification, as when only subsiding basins or screens are used; or a high degree of nitrification, as when high rates of filtration through coarse material are employed; but with the Miles process it is a fundamental necessity, in order to recover the valuable products upon which the cheapness of the process depends, to at the same time disinfect the effluent and attain a much higher degree of clarification than can be obtained by screening or plain subsidence. Therefore there is little temptation to sacrifice safety for cheapness.

The sludge from the Miles process contains much less moisture than activated sludge, and about the same as the subsiding basin sludge and the Imhoff tank sludge, as the following table shows.

TABLE 9

Kind of Sludge.	Average Percentage of Moisture in Sludge.	Relative Volumes of Sludges Containing the Same Amounts of Dry Matter.
Activated sludge	98.5	100
Subsiding basin sludge	91.5	18
Miles process sludge	90.0	15
Imhoff tank sludge	89.0	13.6

As compared with activated sludge, the advantage of handling less than one seventh of the volume of activated sludge is obvious.

Installation Cost

The devices required for the operation of the Miles process are the following:—

Devices for producing sulphur-dioxide gas, and for feeding niter cake or other forms of acid.
Subsiding basins.
Sludge-handling apparatus.
Sludge driers.
Grease extractors.
Grease stills.
Tankage driers and grinders.

While the list is formidable and is enough to rule out the process for small plants, in the case of a city like Boston, however, the cost should not exceed $15,000 per million gallons, daily capacity.

MAINTAINING WATER SUPPLIES IN YARD MAINS*

BY GEO. H. GREENFIELD

IT is frequently found, when making changes or repairs on the fire main systems of large industrial plants, that the amount of protection removed while the water remains shut off is excessive and creates a considerable hazard. This condition can often be improved by installing sufficient sectional control valves, but even then, in large plants, outlying portions of the fire mains are frequently rendered useless when section control valves are shut to allow of repairs, etc.

A system that has recently been adopted by a corporation owning several large plants is as follows:—

Double female hose couplings have been provided at the different works, and, before any section is shut off, the fire main plan is carefully examined by the fire chief. In a great many cases it is found possible to bridge a section of water main that is out of service, or to join up an outlying section by running lines of hose from hydrant to hydrant, using the double female couplings.

In summer the water is turned on, but in cold weather the lines of hose are run and all made ready, but water is not turned on.

During a recent shut-off one Sunday to allow of some extensions on the fire loop at one of the works, the adoption of the above system made it possible for water to be maintained on the lumber yard section, which included five hydrants and three large sprinklered lumber storage buildings. Under normal conditions the protection would have been entirely removed whilst the changes were being made.

A few six, eight and ten-inch soft taper wooden plugs, about two feet long, are kept in the fire station, so that when mains are being cut they can be plugged in a hurry should occasion arise.

The double female hose couplings also serve the additional purpose of allowing municipal fire departments steamers to couple up to the yard hydrants and boost the pressure, should this be necessary through failure of the plant fire pumps, or through excessive demand for water. In the latter event, the system serves a purpose similar to that of the reverse hydrant mentioned by Mr. Charles E. Worthington in the July, 1918, issue of the *Quarterly* ("Planning Factory Water Supplies for Emergencies," page 76).

*From the National Fire Protection Association.

The Ontario Department of Highways will have an exhibition at the coming Good Roads Congress in Quebec, of thirty miniature models of roads in all conditions of construction. Moving pictures of provincial activities in road making will also be shown.