

B.—From mouth of clear water pipe or inlet, in front of screen, at a depth of 10 feet below the surface.

C.—From the tap in pumping-house.

D.—From the tap in basement of City Hall.

## CHEMICAL ANALYSIS.

The following table shows the results of the chemical analysis :

|                                     | GRAINS PER GALLON. |       |       |       | PARTS PER MILLION. |       |       |       |
|-------------------------------------|--------------------|-------|-------|-------|--------------------|-------|-------|-------|
|                                     | A                  | B     | C     | D     | A                  | B     | C     | D     |
| Colour in 2-foot tube.....          | Dark yellow.       |       |       |       | Dark yellow.       |       |       |       |
| Smell at 100° F.....                | Slightly peaty.    |       |       |       | Slightly peaty.    |       |       |       |
| Chlorine.....                       | .035               | .035  | .035  | .035  | .5                 | .5    | .5    | .5    |
| Phosphoric acid.....                | None.              |       |       |       | None.              |       |       |       |
| Nitrogen in nitrates and nitrites.. | .0080              | .0103 | .0126 | .0109 | .1152              | .1482 | .1811 | .1564 |
| Free ammonia.....                   | .0014              | .0014 | .0007 | .0007 | .02                | .02   | .01   | .01   |
| Albuminoid ammonia.....             | .0091              | .0084 | .0084 | .0084 | .13                | .12   | .12   | .12   |
| Oxygen absorbed in 15 minutes.....  | .1912              | .1610 | .1708 | .1629 | 2.732              | 2.372 | 2.430 | 2.327 |
| Oxygen absorbed in 4 hours.....     | .3519              | .3507 | .3507 | .3507 | 5.028              | 5.010 | 5.010 | 5.010 |
| Solids.....                         | 3.80               | 3.70  | 3.92  | 3.92  | 54.0               | 53.0  | 56.0  | 56.0  |
| Hardness as CaCO <sub>3</sub> ..... | 1.64               | 1.40  | 1.55  | 1.55  | 23.4               | 20.0  | 22.1  | 22.1  |

The first conclusion to be drawn from these results is that all the above samples are very similar as to their quality, that from the slide channel being somewhat the worst, owing no doubt to its containing a slightly larger quantity of suspended matter. The other three may, for all practical purposes, be considered identical.

Colour in the 2-foot Tube.—By this test pure water is colourless. The presence of organic matter, especially of a vegetable origin, in solution renders the appearance, under these circumstances, of a green, yellow or brown tint, varying in depth according to the amount of such matter contained.

Smell at 100° F.—The result of this examination may reveal the presence of an injurious quantity of organic matter, but on the other hand a very bad water may not have any objectionable odour. This test is only of importance as a supplementary one.

Chlorine in Chlorides.—The presence of chlorine in considerable quantities indicates the existence of sodium chloride derived either from this salt naturally present in the soil through which the water passes, or from contamination with sewage. The small amount found shows that all these samples of water are free from sewage pollution.

Phosphoric Acid.—Phosphoric acid, except in very slight traces, would indicate contamination with sewage. My results in this particular confirm the opinion as to the absence of sewage expressed in the preceding paragraph.

Nitrogen in Nitrates and Nitrites.—Oxidized nitrogen as nitrates or nitrites in a water points as a rule to contamination with animal organic matter or sewage. The abundance of vegetable life, however, may decompose and assimilate these salts, and hence the absence of such nitrogen cannot be considered as negative evidence as to such pollution. Analysts differ as to the value to be assigned to this datum in forming an opinion on the quality of a water, but the small quantity evinced by the analysis taken in conjunction with the other results adds an additional proof with regard to the absence of sewage pollution.

Free Ammonia.—A large quantity of ammonia, except in water from deep wells, would probably indicate the recent contamination with sewage. The exceedingly small amount present again shows this water to be free from pollution of this sort.