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DIONIC TESTER IN WATERWORKS SERVICE

Portable Apparatus Permits of Quick and Easy Determination of Source of Suspected Flows Where the Municipal Water Supply is of Markedly Different Conductivity than the Ground Water—Relation Between Conductivity and Bacteriological Purity

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ORIGINALLY, the Dionic water-tester, a portable apparatus designed for the determination of the electrical conductivity of water, was devised as a rapid and reliable method for detecting leakages of cooling water into surface condensers.

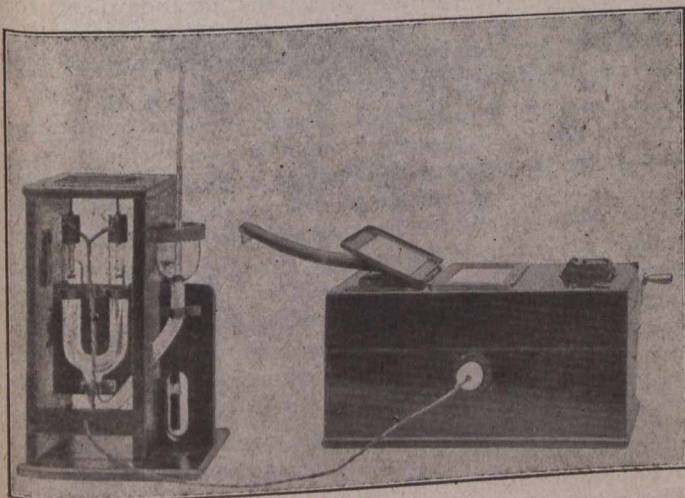
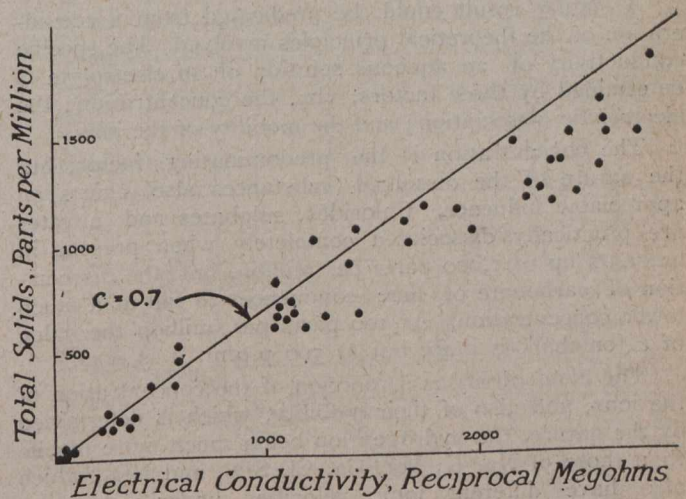
It was later suggested that it could be used for the detection of sewage pollution in water, but experimental work has shown that except in cases of gross pollution, the conductivity method is of little value. There are other purposes, however, for which the apparatus has been found to be of considerable value in the writer's laboratory, viz., the detection of leakages from mains; the estimation of mineral matter in natural waters; and the examination of distilled water.

Detection of Leakages from Water Mains

It is often desirable to determine the character of water in order to ascertain whether it is due to leakage from a water main or service, or is derived from a spring or other natural source. For this purpose the conductivity method will be found to be of great assistance when the conductivity of the public supply is materially less than that of the natural waters. The conductivity of the Ottawa supply is usually about 50 units, a unit

with marked success, and has detected leakages which aggregate over one million gallons per day. In other cases, where water was suspected to be due to leakages, the test has shown it to be ground water and has saved the cost of exploratory digging.

One typical example of the detection of leakages might be cited. A stream of water issued from the face



The Dionic Water Tester

being one reciprocal megohm, and it has been found that ground and spring waters never give a value of less than 200 units. The difference, 150 units, is so large that there is no danger of mistaking one source for the other.

This test, which requires only a very short time for completion, has been applied in Ottawa for several years

of a hill for many years, and was always thought to be ground water finding its way from one of the many fissures of the limestone strata. A sample was tested in the conductivity apparatus and was reported as tap water. The stream was followed up and was found to be due to a leakage amounting to 300,000 gallons per day from a water main.

The only ambiguous results that have been encountered were caused by leakages travelling considerable distances and dissolving sufficient salts from the sub-soil to increase appreciably the electrical conductivity. Such cases have been very small in number and do not seriously detract from the value of the method.

The Dionic water-tester is by no means to be regarded as a substitute for pitometer or aquaphone surveys, but as a complement to them. Leakages that escape to drains and fissures, and which do not appear again, can be found only by the pitometer or aquaphone. But any visible water that cannot be accounted for should be tested for conductivity and its source established.

Estimation of Mineral Matter in Water

The electrical conductivity of water is caused by the presence of ionized salts in solution, and, as the great majority of the salts present in natural waters are com-