monizes most closely with experience. And though exceptions may, and have, been taken to some of his conclusions, and although the existence of nitrogen trioxide in the gaseous state is not proven beyond a doubt, yet, I think I may say, without fear of contradiction, that Dr. Lunge has given us the clearest and most trustworthy explanation of the formation of sulphuric acid that has yet appeared, and one that is not likely to be soon displaced.

A REMARKABLE WATER FOR PUBLIC USE.

By A. A. Breneman.

I have had occasion recently to examine a sample of water taken from the public supply of Long Island City. The water has been a source of much complaint. It is taken from driven wells at a point near Bowery Bay, on Long Island Sound, a few miles from New York City. The wells are said to be rather shallow.

The composition of the water was found to be as follows, in grains per U. S. gallon:

Total solids,	73.665
Sodium chloride,	35.242
Calcium bicarbonate,	6.840
Magnesium bicarbonate,	10.536
Calcium sulphate,	6.283
Magnesium sulphate,	1.437
Magnesium chloride,	7.584
Ferric oxide and alumina,	4.286
Organic and volatile water,	4.505
Insoluble sediment, silica, etc.,	3.892
	80.595
Less Water and CO_2 of bicarbonates,	6.930
	73.665

The water is probably a mixture of well water and sea water. The abundance of magnesium chloride, a characteristic ingredient of sea water, as well as the large excess of common salt, point to this conclusion.

It is said that low ground near the wells is occasionally overflowed with sea water at times of storm or high tide on the Sound and the wells may be contaminated in this way. It is possible also that there is direct percolation of sea water through the soil from the Sound, which is only a short distance from the wells. This water is entirely unsuited for public supply. Its taste is perceptibly saline, especially if taken immediately after drinking pure water. It yields a heavy scale in boilers and has caused much trouble where it was used for manufacturing purposes.*

The sample for the above analysis was taken from a hydrant in Long Island City, Nov. 28, 1891. Samples taken from hydrants in different parts of Long Island City at later dates, for comparison, showed the following results in total solids:

January 12, 1892,	66·184
February 5, 1892,	46·490

The water evidently varies greatly in composition, a fact which comports also with the theory of admixture of land and sea water under complex and varying physical conditions.

An analysis of a sample of well water from Long Island City was made for comparison with the above. The composition was as follows:

Total solids,	45.720
Sodium chloride,	16.143
Sodium sulphate,	5.328
Calcium bicarbonate,	10.232
Magnesium bicarbonate,	8.616
Calcium sulphate,	.168
Magnesium sulphate,	1.020
Ferric oxide and alumina,	1.474
Organic and volatile,	7.089
Insoluble sediment, silica, etc.,	3.209
	53.279
Less Water and CO_2 of bicarbonates,	7.559
	45.720

* Since the above was written complaint has been made by florists in Long Island City, that the city water is injurious to the leaves of plants that are watered with it.

From this analysis it would appear that the underground water of the district is little better than that supplied by the water works. It is free, however, from magnesium chloride, which is quite an important constituent of the hydrant water.

Abstracts of American Patents Relating to Chemistry.

(From the U. S. Patent Office Gazette.)

February 2, 1892.

467,916.—Apparatus for making carbonated beverages. Henry Carse, Rock Island, Ill.

467,981.—Brick kiln. George C. Little, Vance, Kan.

467,987.—Apparatus for purifying or sorting grits. Carl Haggenmacher, Buda-Perth, Austria-Hungary.

467,992.—Process of decolorizing vegetable oils. Walter N. Hartley, Dublin, Ireland, and William E. B. Blenkinsop, London, Eng.

The oils to be decolorized are mixed with a suitable proportion of a manganese soap and a current of air or oxygen blown into the mixture.

467,993.—Apparatus for the production of yeast or similar substances. Alfred Jörgensen, Copenhagen, Denmark, and Axel Bergh, Stockholm, Sweden.

468,049.—Azo dye. Christian Rudolph, Offenbach, Germany.

A blackish powder with metallic lustre, having the properties of dyeing unmordanted cotton directly blackish violet. Soluble in water with violet blue color, and in conc. sulphuric acid with blue color. Reducing agents decolorize the solutions. The dyestuff is obtained by treating tetrazodiphenyl or ditolyl with one molecule of amidooxyalphanaphthalinedisulpho acid and with one molecule of metaoxydiphenylamine or metaoxytolylphenylamine.

468,050.—Beer cooler. Valentin C. Trabold, Newark, N. J.

468,063.—Amalgamating silver ores. Alexis Janin, San Francisco, Cal.

The ore is subjected to the action of free hypochlorous acid, formed by the action of carbonic acid gas or an acid salt on a solution of chloride of lime, agitating the mixture of ore and solution until the silver minerals are chloridized and the free hypochlorous acid or chlorine present have formed combinations having little or no injurious action on mercury, then adding mercury, and concluding the amalgamation in the usual manner.

468,066.—Separator. Fairfax H. Wheelan, Santa Barbara, Cal.

468,084.—Feed water purifier. Frederick J. Henderson, Chicago, Ill.

468,138.—Apparatus for separating oil and water from gas. Charles L. Stock, Fostoria, Ohio.