



## LVI. Note on the existence of phosphoric acid in the deep-well water of the London basin

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benzoic acid, so that the result obtained is exactly what might have been expected from the action of nitric acid on a carburetted hydrogen of the benzoic acid series containing a little oil of bitter almonds.

In conclusion, I may mention that the production of this oil, from its striking and peculiar properties, furnishes an excellent test for detecting the presence of cinnamic acid.

A quantity of the chlorinated oil was also treated for some days, both exposed to the light of the sun and in diffused light, with dry chlorine, in the hope that perhaps a crystalline compound might be produced. In this however I was unsuccessful; much muriatic acid was given off and the liquid became tolerably viscid, but no crystals were formed.

LVI. *Note on the Existence of Phosphoric Acid in the Deep-Well Water of the London Basin.* By THOMAS GRAHAM, Esq., F.R.S.\*

THIS water is obtained on piercing the London clay, which forms an impervious bed, generally exceeding 200 feet in thickness, and flows from fissures in the subjacent chalk. It is always highly soft and alkaline, and remarkable for the predominance of soda salts over earthy salts among its solid constituents. I have never found it to contain a sensible quantity of potash, although salts of the vegetable alkali appear among the constituents of the water of the deep Artesian well of Grenelle.

When evaporated considerably, a small deposit takes place in the London deep-well water, which consists chiefly of carbonate and phosphate of lime. The remaining liquid gives with nitrate of silver a precipitate of chloride and carbonate of silver, which is white without any shade of yellow; but if a portion of the water, amounting to an ounce or two, be evaporated to dryness in a platinum capsule, without removing the precipitate, and the heat afterwards continued so as to raise the temperature of the resulting dry saline matter to low redness, then, on redissolving by distilled water, and adding nitrate of silver, a precipitate is obtained, in which the yellow colour of the phosphate of silver is very perceptible. The earthy phosphate is decomposed by ignition with the alkaline belonging to the water, and the soluble phosphate of soda is produced.

The following are the results of the analysis of the water from the deep well in the Brewery of Messrs. Combe and

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Delafield, Long Acre. An imperial gallon of the water contained 56·45 grains of solid matter, 100 parts of which gave—

Carbonate of soda . . . . .	20·70
Sulphate of soda . . . . .	42·94
Chloride of sodium . . . . .	22·58
Carbonate of lime . . . . .	10·96
Carbonate of magnesia . . . . .	1·92
Phosphate of lime . . . . .	0·34
Phosphate of iron . . . . .	0·43
Silica . . . . .	0·79
	<hr/> 100·66

The growth of green confervæ in this water is extremely rapid, and occasions inconvenience when the water is kept in open tanks. It is a subject perhaps worthy of inquiry, whether the value of some waters for irrigation may not depend upon their containing phosphoric acid, this constituent having hitherto been generally overlooked in waters.

LVII. *On a Crystallized Alloy of Zinc, Iron, Lead and Copper.* By WARREN DE LA RUE, Esq.\*

THE alloy in question was obtained from the worn-out amalgamated zinc plates used in the voltaic battery after the mercury had been recovered by distillation. As the sulphate of zinc, resulting from the solution of the zinc in the battery, is exceedingly pure, it follows that the residue of the plates contains, besides the mercury used for amalgamation, most of the impurities contained originally in the whole plates, and the metal obtained therefrom is consequently much inferior in quality to the original rolled zinc.

Zinc in a fit state for rolling is obtained by running off the fluid portion from a mass of cast zinc which has been allowed to cool down to a certain point after fusion, the metal left behind being less pure than that which flows off. The manufacturer who furnishes me with rolled zinc and takes back the zinc obtained from the worn-out plates, informed me that the latter is unprofitable to re-work from its leaving an unusually large residue in refining; this statement induced me to investigate the composition of this residue, and I proceeded in the following manner.

About 22 pounds of worn-out plates being introduced into an iron pot, and the mercury distilled off by heating it to redness, the fused metal was fined by adding a quantity of tallow and

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