

III.—*Analysis of the Saline Water of Purton, near Swindon, North Wilts.*

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THE water rises in a field on the Oxford Clay, which reaches from the bottom of the hill on which the village of Purton is built, to the river Thames at Cricklade, a distance of about three miles, the spring being about midway between both. The soil of Purton rests on the limestone. The field in which the spring rises has long been known in the neighbourhood as "Salt's Hole." The medicinal properties of the water are held in high esteem by the inhabitants of Purton, and the proprietor has recently erected a pump-room round the well, from which about 120 gallons of the water can be pumped up daily.

The water, which was analysed at the request of Dr. Kinneir, of Purton, was collected by myself in the month of January in the present year. As pumped up from the well, it was quite clear, and remained so after long standing. While the pump was in action, a faint but decided smell of sulphuretted hydrogen was perceptible, but the water itself, while still, had no such odour.

The temperature of the water was nearly the same as that of the air. Specific gravity, at 60°F., = 1·0056. Free carbonic acid, 50 cubic inches per imperial gallon, the water being slowly pumped up from the well.

The analysis was performed in the usual manner, the iodine, which could be distinctly recognised in one pint of the water, being estimated as *protiodide of palladium*.

In the arrangement of the results of analysis, the strongest acid is assumed to be combined with the strongest base; and the lime and magnesia thrown down as carbonates by boiling, are considered as existing in the water as carbonates held in solution by carbonic acid.

Direct results of analysis calculated to 1 imperial pint.

BASES.

Experiment.	Lime.	Magnesia.	Alkaline Chlorides.	Chloride of Potassium.	Chloride of Sodium.
I.	6·422	4·743	18·90	1·179	17·721
II.	6·257	4·783	19·33	1·020	18·310
Mean	6·340	4·765	19·10	1·099	18·016

ANALYSIS OF THE

ACIDS

(or elements replacing them).

Experiment.	Sulphuric Acid.	Chlorine.	Iodine with traces of Bromine.	Silica.	Carbonic Acid, free and combined.	Carbonic Acid as Carbonate of Lime and Carbonate of Magnesia.	Carbonic Acid, free.	Phosphoric Acid.	Apo-crenic Acid.
I. . . .	24.00	2.82	„	0.27	„	2.38	„	„	„
II. . . .	23.80	2.80	„	0.29	„	2.36	„	„	„
Mean	23.90	2.81	0.0094	0.28	5.403	2.37	3.133	0.031	0.112

VERIFICATION FOR LIME.

Experiment.	Lime precipitated by boiling.	Lime left in solution after boiling.	Total by Calculation.	Total by Experiment.
I.	2.828	3.280	6.108	6.422
II.	2.857	3.310	6.077	6.257
Mean	2.842	3.296	6.092	6.340

VERIFICATION FOR MAGNESIA.

Experiment.	Magnesia precipitated by boiling.	Magnesia left in solution.	Total by Calculation.	Total by Experiment.
I	0.11	4.735	4.845	4.748
II	0.15	4.785	4.945	4.783
Mean	0.13	4.755	4.890	4.765

RESIDUE LEFT ON EVAPORATION.

Experiment.	Mineral Residue.	Organic Residue.	Total Residue.
I	51·02	0·114	51·114
II	51·21	0·110	51·320
Mean	51·11	0·112	51·217

Solid Contents of an imperial pint as determined by analysis.

Carbonate of lime	5·0760
Carbonate of magnesia	0·2630
Lime (not as carbonate)	3·2200
Magnesia (not as carbonate)	4·7580
Potash	0·6930
Soda	9·5460
Chlorine	2·8100
Sulphuric acid	23·9000
Silica	0·2800
Phosphoric acid	0·0310
Bromine	traces
Iodine	0·0094
Crenic acid	traces
Apocrenic acid	0·1120
	<hr/> 50·6984
Residue left on Evaporation	<hr/> 51·2170 <hr/>

Saline Constituents in one Imperial Gallon.

Carbonate of lime	40·608
Carbonate of magnesia	2·104
Sulphate of potash	10·264
Sulphate of soda	174·904
Sulphate of lime	62·560
Sulphate of magnesia	76·592
Chloride of magnesium	30·000

Iodide of sodium	.	.	.	.	.	0·088
Silica	.	.	.	.	.	2·080
Phosphoric acid	0·248
Crenic acid	traces
Apocrenic acid	0·896
Bromine	traces
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						400·344
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