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## Soft Water of Central New York

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SOFT WATERS OF CENTRAL NEW YORK

NICHOLAS KNIGHT AND J. B. SHUMAKER

*Sample No. 1.*— The sample of water was taken from a well in the town of Sangerfield, Oneida county, New York, about a mile and a half south of the village of Waterville. It is located on the flat land in the bottom of the Sangerfield valley near the headwaters of Chenango river.

The well is forty-three feet in depth and was sunk in the early eighties. The top soil of the land in the locality is a clay loam and in boring the well the first twenty-seven feet encountered was hard clay. Underneath the clay was a dark coarse sand, entirely different from any other formation in the neighborhood. This is an artesian well and it flows continuously. The figures in the table below express the amounts of the different substances in a million parts of water.

Total solids .....	186.80
SiO <sub>2</sub> .....	13.20
Fe <sub>2</sub> O <sub>3</sub> .....	00.00
Al <sub>2</sub> O <sub>3</sub> .....	3.20
CaCO <sub>3</sub> .....	113.20
CaSO <sub>4</sub> .....	4.00
MgCO <sub>3</sub> .....	42.80
NaCl and KCl .....	11.80
Free ammonia .....	0.00
Albuminoid .....	0.00
Nitrogen in nitrates .....	0.00
Nitrogen in nitrites .....	0.0003

The water is pure and likewise unusually soft for the particular locality.

Dr. A. P. Brigham, Professor of Geology in Colgate University, in a private communication says: — “The bed rocks at Sangerfield for any moderate depth would be sandstone or possibly shaly sandstone of the Hamilton group; but the fact is that most of the well waters and pond waters of the region are very hard owing to the amount of limestone flour which has been incorporated in the local materials of the glacial drift by moving from limestone formations that lie to the northward. However, water of a softer

character is sometimes obtained from the valley bottoms under thick beds of clay."

This water affords another good illustration of how the character of the rock and soil determines the quality of the water in the region.

Our thanks are due Dr. Nelson O. Brooks, physician of the board of health of the city of Oneida, New York, for his interest in sending us the sample of water for this analysis.

*Sample No. 2.*— This is a shallow well, only twelve feet in depth, also from Oneida county, New York, near Fish creek, possibly eighteen or twenty miles distant from the well described in No. 1. The analysis is as follows, in parts per million :

Total solid residue in platinum dish .....	186.4
SiO <sub>2</sub> .....	2.6
Fe <sub>2</sub> O <sub>3</sub> and Al <sub>2</sub> O <sub>3</sub> .....	1.8
CaCO <sub>3</sub> .....	99.6
CaSO <sub>4</sub> .....	27.0
MgCO <sub>3</sub> .....	47.40
NaCl and KCl .....	11.80
Free Ammonia .....	00.00
Albuminoid ammonia .....	00.00
Nitrogen in nitrates .....	0.10
Nitrogen in nitrites .....	0.002

The water is also pure and soft as would be expected from the locality in which the shallow well is located. It is in the pure white sand about half a mile distant from Oneida lake. The water doubtless comes from the lake and so would have half a mile of a pure sand filter. This would easily account for its freedom from organic contamination and softness and absence of much solid matter in solution.

We desire to express our thanks to James L. Bentley for sending us the sample of water.

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