

The results of the examination of the present supply may be of interest, as showing the composition of a mountain water in that region, above all possibility of contamination. Sample taken Feb., 1886.

Appearance, etc.....	Bluish green, cloudy
Odor, heated 100°.....	None
Chlorine.....	0.208
Equivalent to NaCl.....	0.343
Phosphates.....	None
Nitrites.....	None
Nitrogen in Nitrates.....	0.047
Free Ammonia.....	0.003
Albuminoid Ammonia.....	0.002
Hardness.....	2.360
Organic and Volatile.....	1.00
Mineral.....	6.20
Total Solids.....	7.20

NOTE ON THE EXAMINATION OF BUTTER FAT AND ITS SUBSTITUTES.

BY E. WALLER, PH. D.

The Reichert process* for the examination of butter fat and the substitutes therefor, commends itself to chemists on account of ease of execution, and constancy of results. Objections to it exist in the fact that it is so extremely arbitrary, and that the statement of results by it are incomprehensible to any but trained chemists. Notwithstanding this, many prefer it to the Helmer method, or the more generally used modification thereof the "Wash" process. As this last named method or its modification was the first fairly satisfactory method for the examination of butter fat, a strong prejudice naturally exists in favor of the form of report which states the percentages of insoluble, or of insoluble and soluble fat acids present.

I desire to propose a modification of the Reichert process, which seems to me to possess many advantages, premising that for butter fat and its substitutes the terms soluble and insoluble fat acids are practically synonymous with the terms volatile and non-volatile.

* Fres Zts., xviii., 68.

The method is the ordinary Reichert process, using weighed platinum spirals or bits of foil in the Erlenmeyer flask, to prevent the otherwise inevitable bumping. The precaution of evaporating off *all* the alcohol after the formation of the soap* must also be rigidly observed.

The distillation of 50 c. c. of water from the Erlenmeyer, and the determination of the acidity of the same in terms of tenth normal soda solution, completes the Reichert test. I propose to add 50 c. c. of water to the contents of the flask and again to distill off 50 c. c., repeating the operation until the last distillate neutralizes 0.1 c. c. or less of the tenth normal soda. It has been found impossible to get a distillate entirely free from acidity. The total amount of volatile acids is as usual reckoned to butyric acid. With butter fat it was found that the first distillate contains 76 to 79 per cent. of the total volatile acid. Five to nine distillations are required to bring the acidity of the distillate down to 0.1 c. c., Na Cl or below. The method serves to some extent to distinguish different fats by means of the rate of distillation of the volatile fatty acids. *Cocoa nut oil*, for instance, required a very large number of distillations.

The non-volatile fat acids remaining in the flask are then washed two or three times with water to remove potassium sulphate and glycerol, dried and weighed. The use of pumice stone to prevent bumping during the distillation would at this point give trouble with the drying process. Frequently some fat acid collects in the condenser, which should be rinsed out with hot alcohol, and the solution added to the non volatile fat acids.

The results agree very well with those obtained by the more troublesome and longer washing process, interchanging the terms volatile and soluble, and non-volatile and insoluble.

I propose to make an examination of this fat acid which so frequently makes its appearance in any of these distillation processes when applied to fats.

It is possible that it may be lauric acid, mentioned by W. Heintz† although in his investigation of the constituents of butter‡ he failed to report the presence of this acid, or to find cocinic acid (which he regarded finally as a mixture of lauric and myristic), and in the tables of the constituents of butter fat§ lauric acid is not recognized as a constituent.

*Cornwall, 8th Report, N. J. State Board of Health, p. 205.

†Pres. Zts., xvii., 160.

‡Pogg. Ann., xc, 137.

§Allen Commerc. Org. Anal., 1st ed., II. Blyth, p. 285, etc.

On applying to this process the data obtained by Duclaux* we find that the distillation of 50 c. c. from a total of 70 c. c. should give over 80 per cent. of the butyric acid present in the first distillate, and that three distillations conducted in this manner should give practically all. Duclaux found, however, that the presence of glycerol slightly diminishes the proportion of acid distilled over. In this case we have glycerol present, as well as much potassium sulphate, which may exert some influence by making the boiling point of the liquid higher. It is difficult, therefore, to say whether by following up this plan of action we may eventually be able to determine the proportions of the different volatile acids with ease and certainty. The idea, however, looks promising.

ON THE EXAMINATION OF CROTON WATER.

By A. A. BRENNEMAN, S. B.

The analyses of Croton water presented by Dr. Waller cover the period in which my own analyses of the same water were made. (This journal Vol. III., 1), but the differences between our results are so marked as to call for further discussion. Through the kindness of Dr Waller I have had a copy of his paper in time to discuss it at this meeting. The following tables contain some of the results in question, single analyses being compared only when they relate to samples taken on the same day. There were no analyses of the same date during October, November and December, and a comparison of monthly averages is therefore added. As the question at issue relates entirely to albuminoid ammonia all other items are omitted.

ALBUMINOID AMMONIA IN CROTON WATER—PARTS PER 100,000.

Daily Analyses.

Date.	W.	B.	Diff.
1895.			
May 6.....	.0166	.0217	.0051
“ 26.....	.0086	.0192	.0116
June 13.....	.0070	.0190	.0120
“ 30.....	.0140	.0213	.0073
July 15.....	.0080	.0246	.0166
“ 30.....	.0110	.0211	.0101
Aug. 19.....	.0140	.0228	.0088

* Ann. Chem. Phys. [5], II., 233.