

2. In the W-W. method more satisfactory results are obtained by extracting a few times with ether, drying and then extracting again, than by extracting without drying between.

3. In either case the extraction of the last portions of the fat appears to remove something not fat. More of this material appears to be remove in the case of the Adams than of the W-W. process.

This material may exist ready formed in the milk, or may be formed by the physical treatment to which the sample is subjected.

4. In the W-W. method, flat bottomed dishes 2 to 2½ inches in diameter give the most satisfactory results.

5. With fairly rich cream, dilution or some similar device is advisable when the Adams' method is used.

6. The determinations of water in milk, are liable to be too low rather than too high.

Finally, attention should be called to the fact that the assertion that milk contains water, butter fat, casein, lactose and salts is only a broad general statement, which leaves out of account the true complexity of substances which undoubtedly exist in that fluid.

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## SOME CHEMICAL PRODUCTS OF BACTERIAL GROWTH, AND THEIR PHYSIOLOGICAL EFFECT.

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BY E. A. v. SCHWEINITZ,

*Chemical Laboratory, Bureau of Animal Industry, Washington, D. C.*

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For a short time I have been engaged in studying the chemical products formed by the hog cholera and swine plague germs by their growth in artificial culture media, and have succeeded in isolating an albumose and ptomaine from each.

To distinguish the products the names *Sucholotoxin* and *Sucholoalbumin* have been given to the substances from the hog cholera cultures, and *Suplagatoxin* and *Suplagoalbumin*, respectively, from the swine plague cultures.

The albumoses are white, pulverulent substances, soluble with difficulty in water, and precipitated from this solution by absolute alcohol. They can be obtained in crystalline plates by drying over sulphuric acid, *in vacuo*.

The ptomaines are best obtained in the form of the double platinum salts, as the hydrochlorides are difficultly crystallizable. These double salts are very light yellow in color, readily soluble in water, difficult so in alcohol, and appear under the microscope as needle-like crystals. (Specimens of the albumoses and platinum salts were exhibited.)

A subcutaneous injection of a small quantity of these substances is sufficient to produce death in guinea pigs in from 24 to 48 hours.

If, however, a much smaller quantity is injected, and the injection repeated a number of times, the animals are protected from the corresponding disease when communicated by direct inoculation with the germ. In quite a long series of experiments, the check animals invariably died, while the treated ones recovered after inoculation with the germ.

More recently, Dr. W. H. Gray, of Washington, and myself have conducted some experiments upon guinea pigs, and succeeded in producing great resistance and subsequently immunity from diphtheria, by first treating the animals with the chemical products obtained from cultures of the germ.

There is every reason to hope that these results can be turned to practical application in the diseases of both animals and men.

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