NOTE ON THE APPROXIMATE ESTIMATION OF FORMALDEHYDE
IN MILK.

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IN September, 1899, I commenced some experiments on the determination of formaldehyde in milk, and, though other work prevented me from continuing the investigation, a short account of my results may be of interest in connection with Mr. M. Wynter Blyth's paper (see preceding paper).

The reagent used was strong pure sulphuric acid, with 2·5 c.c. normal ferric chloride added per 100 c.c., this being the proportion which experiment showed gave the best colour with formalin in milk. Four mixtures were made containing 0·05, 0·5, 5, and 50 parts of formaldehyde per 100,000 of milk. When a small quantity of each milk was floated on to the reagent and allowed to stand all night, the one containing 0·5 gave an intense violet ring, the one containing 50 parts hardly showed any colour, and the other two gave distinct violet rings. Evidently this was of no value for quantitative work.

After trying shaking various quantities of milk with the reagent I arrived at the following method of working: Ten c.c. of each sample of milk were taken, placed in a 25 c.c. stoppered cylinder, and the reagent was added—preferably from a burette—1 c.c. at a time, to each cylinder in turn, and the colour was observed. The larger the proportion of formaldehyde the sooner does a violet colour appear, and on the addition of more reagent the intensity of the colour increases up to a certain point. The following table will illustrate this:

Reagent. c.c.	Formaldehyde present per 100,000.			
	0	0·5	5	50
2nd	0	0	0	Pale violet.
4th	0	0	Pale violet	Intense violet.
6th	Brownish-yellow	Reddish-violet	Intense violet	Violet, paler than 5.

No distinction could be made between milk with 0·05 per 100,000 of formaldehyde and that containing none. Another example in which the colours were quite distinct all through the experiment will suffice:

Reagent. c.c.	Formaldehyde present per 100,000.			
	0	1	5	10
2nd	Yellow	Buff	Violet	Violet.
4th	Yellow	Violet tinge	Violet	Dark violet.

In practice, the acid is added to 10 c.c. of milk side by side with standard samples, and they are compared after the addition of each c.c. of reagent. The standard samples were made from an aqueous solution of formaldehyde prepared by diluting 1 c.c. of formalin with water to 350 c.c., and assaying by the iodometric method (ANALYST, xxii., 221). I may say that a decided excess of iodine is necessary, or the results may be very much too low. The solution was then diluted to contain 1 part of formaldehyde in 10,000. This solution keeps very well.

Whether the quality of the milk makes any difference to the intensity of the colour, and if there is any advantage in cooling the cylinder between the addition of each c.c. of the reagents, are points that require investigation.