ON THE FALSIFICATIONS OF MILK.

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A LONG list of alleged adulterants of milk is given in the books, some of which, there is every reason to believe, are purely apocryphal. In 1862 I was appointed public analyst for Dublin, and since that year the acts relating to adulteration have been put into operation in that city, and there have been convictions for selling adulterated milk and other articles every year since, and including, 1863. I was appointed analyst for other places in Ireland under the old act of 1860, repealed in 1872. I have therefore much experience as an analyst, especially at a time when there were no prosecutions of food adulterators in England, or, as a rule, in Ireland. During this latter mentioned period adulterators were not exposed to much danger of detection, and I believe their practices were conducted upon a very much larger scale than is the case at present, owing to the operations of the anti-adulteration Acts, even with all their imperfections of construction and administration. I mention these matters for the purpose of showing that I have had excellent opportunities of discovering all the adulterations of milk that have lately been practised in Ireland, and the following notes are a brief record of this experience:—

Adulteration with Water.—Water is, with but very rare exceptions, the only adulterant of milk used in Ireland. It is sometimes liberally employed. Many persons have been convicted in Dublin for having sold milk adulterated with from 50 to 120 per cent. of water—that is, to 100 parts of the pure milk, from 50 parts to 120 parts of water were added. In my certificates I state the amount of water added *to*, and not the amount of added water *in*, the milk. The most extreme case of adulteration with water which I have met with occurred some years ago at the workhouse, Mountmellick. The doctor noticed that an undue proportion of the children were suffering from rickets, and showing signs of under-nutrition. Acting on his suggestion, the guardians sent me three samples of the milk supplied by three different contractors: one I found to be a mixture of two parts of milk and one part of water, the second was composed of equal parts of milk and water, and the third consisted of two parts of water and one of milk—it contained only four parts of solid matter per 100 parts. One of the contractors who supplied this wretched stuff was a churchwarden of the parish!

The results of a large number of analyses of milk of undoubted purity have convinced me that the minimal standard of 9 per cent. of solid matters, minus fats, in milk is perfectly reliable. The adoption of this standard enables us to detect the addition of water to milk even when the total solids amount to more than 12 per cent. Some time ago I made an analysis of the mixed milk of a herd of Alderney cows owned by Colonel Forde, D.L., Seaforde, County of Down, and the following are the results obtained:

100 parts contained:—				
Water	...	...	...	84.00
Fats	...	...	...	6.86
Cheesey matters and sugar	...	...	...	8.44
Ash	...	...	...	0.70
				100.00
The milk therefore contained:—				
Solids <i>minus</i> fats	...	...	...	9.14
Fats	...	...	...	6.86
Total Solids	...	...	...	16.00

Here we have milk of exceedingly rich quality, and yet the solids, minus fats, did not exceed the proportion found in poor milk. The addition of even 6 per cent. of water to this rich milk could be detected. I may add, that this milk yielded 20 per cent. of cream, which I was informed was the usual proportion obtained in the dairy.

Adulteration with Sugar.—Only three cases of adulteration with sugar, and one with treacle, have come under my notice. In two of the former cases there were prosecutions by the Corporation of Dublin, but both unfortunately failed,—one owing to the death of the defendant before the case came on for trial; the other on account of a technical error made by the food inspector concerned in the case. In one of these cases the adulterants consisted of 90 per cent. of water and 1·5 per cent. of sugar; in the other 50 per cent. of water and $2\frac{1}{2}$ per cent. of sugar.

Adulteration with Common Salt.—I cannot understand the object of adding salt to milk, but this substance is occasionally used for that purpose in Ireland. Last year the guardians of the North Dublin Union prosecuted a contractor who had supplied to them milk which I had certified was adulterated with 50 per cent. of water, and at least 0·5 per cent. of common salt.

Adulteration with Chalk.—It is a popular belief of great antiquity that chalk is a common adulterant of milk. On the other hand I am under the impression that public analysts doubt that such a sophistication ever existed. I have to record one, and the only, case that has come under my notice. A specimen of milk sent to me for examination by the guardians of Millstreet Union, county of Cork, was found to contain 1·11 per cent. of ash, of which one-half was insoluble in water, dissolved with effervescence in hydrochloric acid, and yielded lime equal to $\frac{1}{2}$ per cent. of carbonate of calcium in the milk. The article was well watered, but the chalk had probably been added to rather stale milk to correct acidity, for the weather at the time was very hot.

Adulteration with Flour.—In Ireland this form of adulteration is excessively rare, as I have met with but one case of it. Last year I examined a specimen of milk for Mr. Lewis, the well-known perfume manufacturer, of Dublin, and found that it contained a very large amount of rice flour.

These are the only adulterants which I have found in milk. When the enormous number of samples which I have examined is considered, the cases of sophistication with articles other than water are extremely few and unimportant, numbering altogether only six, exclusive of salt, which is frequently added to milk. As these cases are authentic, and as similar forms of adulteration, except, perhaps, with salt and sugar, have not been noticed by the modern “public analysts,” it is worth while placing them on record.

Milk deficient in Fats.—The practise of selling milk which has been deprived by skimming of a portion of its cream is much more general in England than in Ireland; but a very common practice in the latter country is to sell as whole milk that portion which is first drawn from the cow, and is termed “foreings,” or fore milk. The fore milk is very poor in fat, which is the most valuable constituent of the article; whilst the portion of the milk last drawn (“strippings”) is extremely rich in fats, and, in fact, is sometimes like cream. The average amount of fats in whole milk is about $3\frac{1}{2}$ per cent.; whilst in fore milk it sometimes sinks so low as 0·5 per cent. So common is the practise of selling fore milk for whole milk that when I find a milk to have less than $2\frac{1}{2}$ per cent. of fats, I certify that it has been deprived of a portion of its cream by skimming, or that it is fore milk, which practically is the same thing. On this form of certificate there have been many convictions obtained. In August, 1877, a dairy proprietor was fined £10 for having sold fore milk as whole milk, by a Dublin police magistrate. He confessed to the practice in court, and added that he sold the strippings as cream!