

The crystals can be filtered out from the mother liquor, and can be properly washed and isolated. Hence, this method can be utilised for purification of ordinary alkali metal soaps by crystallisation. That even the typically amorphous substances, like proteins, resins, soaps, etc., can be crystallised under proper conditions has been amply proved by the recent crystallisation of many proteins, enzymes, etc., and the present observation only confirms this view showing that alkali metal soaps are no exception to the rule.

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<sup>1</sup> *Kolloid-Z.*, 1930, 50, 12.

<sup>2</sup> *J. C. S.*, 1927, 1392.

<sup>3</sup> *Ibid.*, 1933, 920.

<sup>4</sup> Alexander's *Colloid Chemistry*, 1, p. 138.

<sup>5</sup> Vold and Ferguson, *J. A. C. S.*, 1938, 60, 2066; Marton, McBain and Vold, *Ibid.*, 1941, 63, 1990.

<sup>6</sup> *Z. Phys. Chem.*, 1936, A 176, 397.

<sup>7</sup> *Trans. Farad. Society*, 1938, 34, 660.

<sup>8</sup> Palit, *Curr. Sci.*, 1941, 10, 436.

#### A SIMPLE AND EFFICIENT METHOD FOR THE DISPERSION OF CALCAREOUS SOILS

PROPER dispersion of soils is an important prerequisite for carrying out the mechanical analysis. The international method of dispersion is satisfactory for many soils; but highly calcareous soils resist dispersion.<sup>1</sup> The black cotton soils belong to this class, and the exact cause of this behaviour has been a puzzle.<sup>2</sup> Our experiments with a Mysore black cotton soil (from the Government Experimental Farm, Hiriyur) confirmed the above result. A systematic investigation has revealed that the resistance to dispersion is not due to (a) organic matter, or (b) ferric or aluminium ions. It is mainly caused by the presence of calcium ions.

Since the resistance to dispersion is due to the presence of calcium ions, we have tried to overcome this by using calgon (sodium hexametaphosphate) which is well known to fix

calcium and magnesium ions in the form of soluble complexes. The exact procedure adopted by us is as follows: 50 g. of soil are soaked overnight in 350 c.c. of water containing 0.32 g. of sodium hydroxide and 2.0 g. of sodium hexametaphosphate. The suspension is then stirred by means of Bouyoucos stirring apparatus for fifteen minutes and made up to a litre with distilled water. The silt and clay are determined after sedimentation for an appropriate interval of time, employing the buoyancy technique developed in this laboratory.<sup>3</sup> A few experiments were also tried omitting the addition of sodium hexametaphosphate with a view to find out the influence of hexametaphosphate on the extent of dispersion. The results are given in Table I.

TABLE I

Expt. No.	Dispersion using sodium hydroxide alone		Dispersion using sodium hydroxide with sodium hexametaphosphate	
	% silt	% clay	% silt	% clay
1	25.6	35.7	13.3	47.3
2	25.4	35.8	14.2	46.4
3	26.6	35.7	19.8	45.2
4	27.2	35.4	19.3	46.7
Average	26.2	35.7	16.7	46.4

The results show that the addition of sodium hexametaphosphate increases the yield of clay by about 10 per cent. Moreover, we may point out that we get a higher percentage of clay by the new method of dispersion than by the International methods or by Puri's method. The process of dispersion itself is extremely simple and very quick. We believe, it is the best for calcareous soils and possibly for other soils too. We have found that the addition of considerable quantities of calcium chloride does not materially affect the extent of dispersion in presence of the hexametaphosphate whereas, without the latter even small amounts of calcium chloride considerably reduce the

amount of clay. The details of these investigations will shortly be published elsewhere.

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<sup>1</sup> G. W. Robinson, *Imperial Bureau of Soil Science, Technical Communication*, 1931, No. 17, p. 8.

<sup>2</sup> —, *Soils, their Origin, Constitution and Classification*, 1932, p. 323.

<sup>3</sup> (Miss) G. Sharada Bai, Basrur Sanjiva Rao and K. S. Gururaja Doss, *Proc. Ind. Sci. Cong.*, 1942, p. 206.

#### A CHEAP SUBSTITUTE FOR AMYL ALCOHOL USED IN THE DETERMINATION OF FAT IN MILK

OF the numerous methods in use for the estimation of fat in milk, the one due to Leffmann-Beam as modified by Gerber is widely adopted by dairy workers. This method entails the use of pure Iso-amyl alcohol. This commodity, having gone up considerably in price due to war, now selling at Rs. 14-22 per pound, attempts were made to find out a cheaper substitute for the same without in any way sacrificing the accuracy obtainable by the Gerber's method, and the one that suggested itself was Fusel Oil, a by-product in the alcoholic fermentation of molasses. The fusel oil obtained from Messrs. Carew & Co., Ltd., Rosa, Shajahanpur, U.P., contains about 60 per cent. of iso-amyl alcohol in addition to various other alcohols and costs Re. 1-8-0 only per gallon of 10 lbs.

Comparative determinations of fat in milk were made by the standard Gerber's method on the one hand and by the same method substituting fusel oil in place of amyl alcohol on the other, with the following results. The quantity of fusel oil required for a determination is the same as that of amyl alcohol.

The accompanying table shows clearly that there is a very close agreement between the two methods. The low cost of fusel oil combined with the accuracy obtained by its use must

Source of Milk	Percentage of Fat			
	Gerber's method	Fusel Oil method		
Cow Rajbhani ..	6.0	6.0	} Fusel Oil from Waldie & Co.	
„ Lakhurki ..	5.7	5.7		
„ Nahmohini ..	10.7	10.8		
„ Edadai ..	6.4	6.4		
„ Charuki ..	6.5	6.5		
„ Edmohini ..	10.8	10.8		
„ Emdungi ..	10.6	10.6		
„ Edwa ..	5.5	5.5		
Milk from the Nutrition Room, I. A. R. I. ..	5.9	5.9		} Fusel Oil from Carew & Co.
House sample A ..	5.4	5.4		
„ „ B ..	4.8	4.8		
Local Buffalo Milk ..	4.1	4.1		

recommend itself to those engaged in milk testing. It is suggested, however, that a comparison with the Standard Gerber's test be once made, every time a fresh consignment of fusel oil is received, to be sure that it is of the desired quality.

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#### SHELL-FISH FISHED BY THE STEAM TRAWLER "LADY GOSCHEN".\*

It would be interesting to readers whose hobby is conchology to hear about some interesting finds made by the Steam Trawler "Lady Goschen", a fishing vessel which was employed by the Madras Government to investigate the possibilities of deep-sea fishing in the seas of Madras Province from 1927-30.

One of the most remarkable animals included in the hauls made off Negapatam from 75 to 80 fathoms was *Xenophora pallidula* Reeve,† a handsome spire-shell which had agglutinated to itself both live and dead shell-fish as will be seen in the sketch. Attached to the base were found several living specimens of *Amalthea* (*Mallurium*) *lissa* (Smith). The dead shells were *Turris indica* Roding, *Inquisitor variabilis*

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† I am indebted to Mr. R. Winckworth of the Royal Society, London, for naming most of the shells mentioned in this paper.