by Hilditch and co-workers for cow milk fat[3,10] are not, however, inconsistent (as judged by saponification equivalents and iodine values of residual ester fractions) with the presence of one or both of these acids in this fat. Indeed, Bosworth and co-workers[11,12] tentatively claimed the presence of these acids in cow milk fat, a claim which seems to have been neglected by subsequent investigators.

Linoleic, linolenic and arachidonic acids are known to be essential in the nutrition of rats[13,14]. The possibility of the physiological importance of eicosadienoic acid is of great interest. Work on the constitution of these acids is in progress.

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Effect of Hydrogen Ion Concentration on Cation Exchange in Clay Salts

THE lyotrope series is usually observed in the exchange of cations from clays and permutites[1,2]. Deviations from this series have also been reported[3,4]. These have been attributed to the structural peculiarities of the clays[2,3] and variations in the hydration of cations[4]. Differences in the relative effects of Ba^{++} and Ca^{++} ions in the interaction of hydrogen clays with neutral salts and bases have been observed[5,6,7], depending on the prevailing *p*H of the system. Symmetry values[3] of a number of clay salts against various electrolytes (chlorides) have been measured with and without adjustment of the *p*H of the system at a constant value by the addition of the requisite amount of hydrochloric acid. When a constant *p*H is not maintained, deviations from the normal lyotrope series often occur, especially in clays containing montmorillonite as judged from X-ray analysis. The deviations disappear when the symmetry values measured at a constant *p*H ranging from 6·0 to 7·0 are compared. At a constant *p*H between 3·0 and 5·0, all the cations examined give the same symmetry value, and the cation effect as envisaged in the lyotrope series altogether disappears.

At a low *p*H (3·0), hydrochloric acid alone gives a higher symmetry value than when used in conjunction with the salts. Al^{+++} ions are likely to be exchanged at this *p*H for the cations of the added salt[8]. No appreciable exchange of aluminium at this *p*H would occur if hydrochloric acid alone were added[10]. The lower symmetry value observed in the presence of salts can be explained if one takes into account the Al^{+++} ions exchanged for the cation of the salt.

Further work is in progress.

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A Labour-saving Method of Sampling

IF a fraction p of a population have the attribute A, then it is well known that if m members out of a sample of N have this attribute, the best estimate of p is $\frac{m}{N}$, and its standard error is $\sqrt{\frac{m(N-m)}{N^3}}$ or $p\sqrt{\frac{1-p}{m}}$. Supposing, therefore, that we want our estimate of p to be correct within a standard error of 10 per cent of its value, we must count a sample containing $100(1-p)$ members with the attribute A. If we do not know p roughly beforehand we do not know how large to take our sample. For example, if we wish to estimate the frequency of a type of blood corpuscle, and count 1,000 blood corpuscles in all, we should get such values as $20 \pm 1{\cdot}3$ per cent, or $1 \pm 0{\cdot}31$ per cent. The former value would be needlessly precise for many purposes. The latter would not differ significantly from an estimate of 2 per cent.

The standard error is almost proportional to the estimated frequency if we continue sampling until a fixed number m of the minority with attribute A have been counted, and then stop. Supposing the total number in the sample is now N, we cannot use $\frac{m}{N}$ as an estimate of p. It can, however, be shown that $\frac{m-1}{N-1}$ is an unbiased estimate of p, with standard error very approximately $\frac{1}{N}\sqrt{\frac{m(N-m)}{N-1}}$, or $p\sqrt{\frac{1-p}{m-2}}$, which is nearly proportional to p when this is small. Thus to get a standard error of about 10 per cent of the estimate we should have to count until we had observed a number m of the rarer type A, which only varies from 102 when p is very small, to 72 when it reaches 30 per cent. If we were content with a standard error of $0{\cdot}2p$ we could take a quarter of this value, and so on.