CHDBrCHDBr was prepared from acetylene and DBr⁷.

Table 2. Per cent isotopic contaminations in the deuterated vinyl fluoride samples prepared. Amounts estimated from infrared gas spectra.

Sample **	Per cent contaminant (I—VI)					
I	II	III	IV	V	VI	
I	—	0	0	0	0	0
II	0	—	0	0	0	0
III* 5—10	0	—	0	0	0	0
IV*	0	0	3—5	—	0	0
V	0	0	3—5	0	—	0
VI	0	0	0	3—5	3—5	—

* *cis-trans* mixture.

V and VI were prepared from CD₂BrCD₂Br with an indicated isotopic purity of 95 %. The sample was kindly given to us by dr. Leitch, N.R.C., Ottawa.

** Designation as in Table 1, consistent with Ref.¹.

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Determination of Barbituric Acid Derivatives as Mercury Complexes

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Barbituric acid derivatives give precipitates with mercuric ions and this characteristic has since long been used for their detection and determination¹⁻³. The precipitates are, however, soluble in certain organic solvents and this fact has been the base for the present method, the principles of which are as follows.

To a solution of 50—250 µg of a barbituric acid in 10 ml of water add 1 ml of 0.3 % mercuric nitrate solution and buffer solution to pH 8.0. Extract with 3 or 4 × 10 ml of a suitable organic solvent. Filter the organic phase through glass-wool moistened with the solvent, carefully avoiding any entrainment. To the combined extracts add an exactly measured volume of a 0.0015 % dithizone solution in chloroform and dilute to 100 ml with chloroform. Make a blank by mixing an equal amount of the dithizone solution with the same volume of the extraction solvent as above and making up to 100 ml with chloroform. Measure the extinction difference at 605 mµ. Calculate the amount of the barbituric acid from a standard curve prepared by applying the method to known quantities of barbiturate. It is, however, more convenient to use mercuric chloride when constructing a standard curve which can be used for all barbituric acids. 1 mole of mercury corresponds to 2 moles of the N-substituted barbiturates and to 1 mole of all the others.

Smaller amounts of barbituric acid can easily be determined by reducing the volumes. Thus, 2 µg of amylobarbitone (amytal) in a final volume of 5 ml gives an extinction difference of 0.130 in 1 cm cuvette, which corresponds to a sensitivity 5 times greater than that obtained by the ultraviolet methods now in use⁴.

The optimum pH range of the extraction varies for different barbiturates, but a pH of 8.0 is suitable for most of the compounds.

Chloroform can be used for the extraction of the N-substituted compounds and of 5-isoamyl-5-ethyl- and 5-allyl-5-phenyl-barbituric acids. Chloroform with 20 % dioxane is suitable for 5-ethyl-5-phenyl-barbituric acid. Chloroform with 20 % of benzyl alcohol extracts 5,5-diallyl-, 5,5-diethyl-, 5-allyl-5-isopropyl-, and 5-ethyl-5-cyclohexenyl-barbituric acids.

The infrared spectra of some barbituric acids and their compounds with sodium, barium, and mercuric ions indicate that the mercury forms complexes rather than salts with the barbituric acids.

Of compounds containing nitrogen and having a structure similar to barbituric acid certain hydantoin and cyclic imides of dicarboxylic acids will be extracted and interfere.

The method has been applied to the determination of barbituric acids in blood. A full report will be published elsewhere.

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A New Type of Cholinesterase in Sow's Milk

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Choline esters are generally not hydrolysed by milk. In two instances, however, milk was shown to exhibit high or moderate cholinesterase activity (acetylcholine used as substrate), *i.e.*, the colostrum of dog¹ and the colostrum and milk of swine². These two sources of cholinesterases are interesting species differences in biochemical behaviour for which no biological explanation is known so far.

Table 1. Enzymic hydrolysis of various choline esters and phenyl esters by the milk of sow and cow. Substrate concentration, 0.01 M. Activity expressed in b_{30} per 0.1 ml of milk.

Acyl radical	Choline esters		Phenyl esters	
	Sow	Cow	Sow	Cow
Acetyl	290	0	465	1
Propionyl	280	1	255	1.5
Butyryl	500	1	205	0
Benzoyl	65	1	—	—
Succinyl	55	0	—	—

The properties of cholinesterase present in sow's colostrum and milk were investigated in connection with studies on the variation of esterase activities of milk and plasma of swine during the course of lactation and suckling³. The most characteristic feature of this esterase (Table 1) is the rapid hydrolysis of choline esters and phenyl esters; in the first group of esters butyrylcholine is hydrolysed at the highest rate, in the second group the acetate is hydrolysed more rapidly than both the propionate and butyrate. The specificity pattern with choline esters as substrates differs from those of all other cholinesterases known, except that of swine plasma cholinesterase which contains the same enzyme in 20–25 times lower concentration; the exceptional substrate specificity of the plasma enzyme as far as choline esters are concerned was reported previously^{4,5}. Both acetylcholine and propionylcholine are hydrolysed more slowly than butyrylcholine, and acetylcholine more rapidly than propionylcholine. Benzoylcholine and succinylcholine are also split by the milk esterase; the hydrolysis of the latter ester is exceptional since no other animal tissue so far studied hydrolyses this ester at such a relatively high rate.

It was demonstrated in summation experiments, as well as in inhibition experiments with selective esterase inhibitors, that a single enzyme in sow's milk is responsible for the hydrolysis of both the choline and aromatic esters tested. It is characteristic of this esterase that butyrylcholine and phenyl acetate are hydrolysed at about the same high rate when tested at the same substrate concentration ($[S] > 5 \times 10^{-3}$ M); in this concentration range K_s is the same for the two reactions (2.8×10^{-3}). Triglycerides are also