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## Toxicity of Synthetic Methanol.

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The importance of synthetic methanol as an industrial solvent is rapidly increasing. Because of the rather widespread belief among the laity that the synthetic product is less toxic than natural methanol this investigation was undertaken. Although the purest synthetic\* and the purest natural† methyl alcohol were used it was observed that the former had very much less odor than the latter. Possibly this is the basis for the popular belief that the synthetic product is the less toxic.

Male white mice between 18 and 20 gm. in weight were selected. Two groups of 30 mice in each experiment were injected intraperitoneally with equal volumes of the synthetic or the natural methyl alcohol diluted 50% by volume with water. Three experiments were performed in which 0.4 cc., 0.5 cc., and 0.6 cc. of solution per 25 gm. of mouse were injected. An arbitrary time interval of 72 hours subsequent to the injection was taken as the period of survival. Post mortem examination was performed routinely and in no instance could death be attributed to causes other than methyl alcohol. The table indicates the results.

TABLE I.—*The Toxicity of Synthetic Methanol.*

	No. mice injected	Vol. of 50% methanol solution per 25 gm. weight	% dead in 72 hours
Synthetic	30	cc.	
Natural	30	0.4	20
		0.4	16.7
Synthetic	30	0.5	30
Natural	30	0.5	36.7
Synthetic	30	0.6	90
Natural	30	0.6	96.7

Loss of pupillary reaction to light and failure to respond to visual stimuli ensued in rabbits when either synthetic (3 animals) or natural (3 animals) methanol was administered by stomach tube in a dose of 6 cc. per kilogram of body-weight every 24 hours for 3

\* Supplied by Commercial Solvents Corporation.

† Supplied by Mallinckrodt Chemical Company.

days. Each dose is somewhat higher than the single narcotic dose given by Sollmann and Hanzlik,<sup>1</sup> but no narcosis was produced. However, the series was small, consisting of 3 animals in each group. Nevertheless, it seems justifiable to conclude that there is no significant difference in the two products as regards their effects presumably on the optic nerve in the rabbit.

*Conclusions.* 1. There is no difference in toxicity between synthetic and natural methanol when injected intraperitoneally into the white mouse. 2. Both the synthetic and natural methanol in equal amounts produce apparent blindness in rabbits.

It appears that the pathology of methyl alcohol poisoning is quite well established. The object of the experiments as submitted was to compare the toxicity of the synthetic product with that of the natural methanol. In acute poisoning with methyl alcohol frequently no gross pathological changes are observed; the characteristic changes in the retina appear only somewhat late and subsequent to optic atrophy.

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### Determination of Plasma Phosphatase.

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The significance of phosphatase in bone physiology was suggested by Robison and his coworkers. Increased plasma phosphatase was recently reported by Kay in *ostitis fibrosa*, *ostitis deformans*, active rickets and *osteomalacia*. Kay also reported a method for the determination of plasma phosphatase.<sup>1</sup> In an experimental study of plasma phosphatase in *ostitis fibrosa*, which we produced in young guinea pigs and dogs by prolonged treatment with parathormone<sup>2, 3, 4, 5</sup> we found Kay's method of determination of plasma

<sup>1</sup> Sollmann and Hanzlik, *Experimental Pharmacology*, Philadelphia, 1928, 270.

<sup>2</sup> Kay, H. D., *J. Biol. Chem.*, 1930, **89**, 235, 249. In the latter paper Kay also reviews the previous work of Robison and associates.

<sup>3</sup> Bodansky, A., Blair, J. E., and Jaffe, H. L., *Proc. Soc. Exp. Biol. and Med.*, 1930, **27**, 708; *J. Biol. Chem.*, 1930, **88**, 629.

<sup>4</sup> Jaffe, H. L., Bodansky, A., and Blair, J. E., *Proc. Soc. Exp. Biol. and Med.*, 1930, **27**, 710; *Arch. Pathol.*, 1931, **11**, 207.