bon atoms. Similarly the phenyl ethyl propanediol is more effective than the phenoxy ethyl analogue. However, propanediols possessing a quaternary carbon are not necessarily anticonvulsant as is witnessed by the lack of activity of the 2,2-dimethyl-1,3-propanediol (No. 1).

Putnam and Merritt(7) have stated that practically all substances with marked anticonvulsant properties contain at least one phenyl nucleus in a terminal position. If two phenyl nuclei are present they are both attached to the same carbon atom. It is of interest that in conformity with this rule the propanediols containing one or two phenyl nuclei show strongest anticonvulsant activity.

The propanediols differ from other anticonvulsants of the barbiturate, hydantoin, and oxazolidine-2,4-dione series in possessing a very short duration of action. When animals were repeatedly subjected to electroshock seizures, propanediols were effective 30 minutes after administration of the drug but gave no protection 90 or 150 minutes after administration. Mephenesin showed a similarly short duration of action. Phenobarbital on the other hand had a long duration of action and full activity came on slowly.

It is of interest to speculate whether compounds related to substituted 1,3-propanediols occur as degradation products of certain barbiturates in the body. It may be that for instance phenobarbital is broken down in the body to urea and a product related to 2-ethyl-2-phenyl-1,3-propanediol. Goodman and Toman(8) have pointed out that no unequivocal proof has ever been advanced to indicate that antiepileptic drugs act *per se* to prevent seizures and it is within the realm of possibility that a compound derived from 2-ethyl-2-phenyl-1,3-propanediol is the effective anticonvulsant agent of phenobarbital. The effectiveness of the barbiturates and the propanediols in both electroshock and chemoshock convulsions certainly appears to point in this direction.

Summary. 2,2-Disubstituted-1,3-propanediols in suitable dosage prevent electroshock convulsive seizures in mice. The molecular configuration favorable for maximal anticonvulsant activity is the presence of a quaternary carbon atom to which one or two phenyl radicals are attached. The possibility is pointed out that derivatives of propanediols occur in the body as degradation products of certain barbiturates and they may constitute the effective anticonvulsant substances.

7. Putnam, T. J. and Merritt, H. H., *Arch. Neurol. and Psychiat.*, 1941, v45, 505.

8. Goodman, L. S., and Toman, J. E. P., *Proc. First Nat. Med. Chem. Symposium, Am. Chem. Soc.*, 1948, 93.

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Effect of Intratracheally Administered Wulfenite on Lungs of Mice. (19046)

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Evans(1-3) reported that the introduction of piezo-electrically active materials into the tracheae and peritoneal cavities of rats and of rabbits resulted in extensive proliferation of fibrous tissue in the lungs and in the abdomen. This reaction was thought to result from the electromotive charges given off by the dusts when exposed to stresses and strains in the body tissues. Evans felt that this property might explain the pathogenesis of pneumoconiosis, since Lanza's data(4) indicated that

1. Evans, S. M., *J. Ind. Hyg. and Toxicol.*, 1948, v30, 353.

2. Evans, S. M., and Zeit, W., *J. Lab. and Clin. Med.*, 1949, v34, 592.

3. Evans, S. M., and Zeit, W., *J. Lab. and Clin. Med.*, 1949, v34, 610.

4. Lanza, H. J., *Silicosis and Asbestosis*, Oxford Press, 1938.

only dusts possessing the property of piezoelectricity are capable of inducing pneumoconiosis. This hypothesis has been adopted by Chess(5) as a possible explanation for the pathogenesis of regional enteritis. Since the original work has not been verified the present experiment was performed.

Methods. The piezoelectrically active material wulfenite was obtained from the National Bureau of Standards and processed in the fashion described by Evans. The material was ground by hand until 35% passed through a 200-mesh screen and it was then suspended in distilled water. Thirty-eight littermate mice of the Sprague-Dawley strain, approximately three months old, were then anesthetized with ether and 0.1 cc of the suspension (25 mg of wulfenite) was injected directly into the trachea of each animal through an 18 gauge needle. Four animals were then sacrificed at 2 to 4-week intervals over a period of 5 months. The lungs were removed and examined histologically.

Results. At autopsy the lungs of 34 of the mice appeared normal. During the later months 4 of the animals showed areas of pneumonia and an occasional emphysematous bleb. Microscopic examination of the lungs of all of the animals revealed small particles of wulfenite scattered at random, and in high concentration, throughout the lungs of all but 4 of the mice. In the latter no particles were seen. In no instance was there any suggestion of fibrous tissue reaction to this accumulated material, nor was there evidence of inflammatory reaction. The photomicrograph (Fig. 1) is typical of the lungs containing wulfenite.

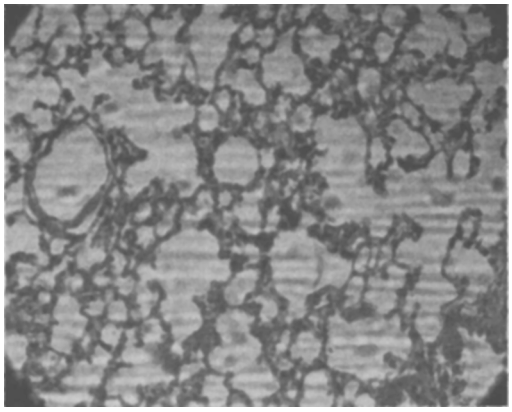

FIG. 1. Mouse lung containing particles of wulfenite scattered through normal alveoli without evidence of fibrous tissue reaction.

Discussion. Under the conditions of the above experiment wulfenite failed to elicit any fibrous tissue reaction in the lung. Although the maximum particle size (0.074 mm) was larger than that reported by Evans (.049 mm) many particles of very small size were evident in the sections. In no instance was there any form of cellular reaction to these particles. A species difference in susceptibility to piezoelectrically active materials could possibly account for the discrepancy in the results since mice were used in this experiment, whereas Evans used rats and rabbits.

Summary. The piezoelectrically active dust, wulfenite, of maximum particle size .074 mm was administered intratracheally to 38 mice. In no instance was there evidence of cellular reaction to the wulfenite in the lungs of these animals. The theory that a substance, by virtue of its possession of piezoelectric properties, can produce reaction in the living organism requires further confirmation.

5. Chess, S., Olander, G., Priestow, C. B., Benner, W., Chess, D., *Surgery, Gynec. and Obstet.*, 1950, v91, 34.

Received September 12, 1951. P.S.E.B.M., 1951, v78.