

(4) On the basis of animal experiments Theelol appears to be the ideal estrogenic principle for oral use.

## REFERENCES.

- (1) Doisy, Veler and Thayer, *Am. J. Physiol.*, 90, 329 (1929).
- (2) Doisy, Veler and Thayer, *J. Biol. Chem.*, 86, 499 (1930).
- (3) Doisy, Thayer, Levin and Curtis, *Proc. Soc. Exptl. Biol. Med.*, 28, 88 (1930).
- (4) Doisy, Thayer and Levin, *J. Biol. Chem.*, 91, 641 and 655 (1931).
- (5) Curtis and Doisy, *Ibid.*, 91, 647 (1931).
- (6) Marrian, *Biochem. J.*, 24, 435 and 1022 (1930).
- (7) Marrian, *J. Soc. Chem. Ind.* (London), 50, 368 (1931).
- (8) Butenandt and Hildebrandt, *Z. physiol. Chem.*, 199, 243 (1931).
- (9) Burn and Elphick, *Quart. J. Pharm.*, 5, 192 (1932).
- (10) Laquer and de Jongh, *J. Pharm. and Exp. Ther.*, 36, 1 (1929).
- (11) Kochmann, *Arch. exptl. Path. Pharmacol.*, 152, 52 (1930).
- (12) Marrian, Dodds and Dickens, *Quart. J. Pharm.*, 5, 195 (1932).
- (13) Coward and Burn, *J. Physiol.*, 63, 270 (1927).
- (14) Becker, Mellish, D'Amour and Gustavson, *J. Pharm. and Exp. Ther.*, 43, 693 (1931).
- (15) Allen and Doisy, *J. Am. Med. Assoc.*, 81, 819 (1923).
- (16) Kahnt and Doisy, *Endocrinol.*, 12, 760 (1928).
- (17) Hinglais and Hinglais, *Compt. rend. soc. biol.*, 117, 1005 (1934).
- (18) Mac Corquodale, Thayer and Doisy, *Proc. Soc. Exptl. Biol. Med.*, 32, 1182 (April 1935)

## THE BACTERICIDAL AND BACTERIOSTATIC VALUE OF COLLOIDAL CADMIUM PROTEINATE.\*

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It has been known for many years that various colloidal silver compounds exert considerable bacteriostatic action and some bacteriocidal action. In more recent years a large number of other heavy metal compounds have been prepared in the colloidal state and found to be somewhat active in these respects. Notable among these were compounds of mercury and copper. Cooper and Nicholas, *J. Soc. Chem. Ind.*, 49, 386T (1930), called attention to the fact that cadmium acetate was germicidal in a dilution of 1:70,000. Since in the cases of silver and mercury, at least, the germicidal action exerted by soluble ionizable salts of the metals is partially retained by colloidal dispersions of otherwise insoluble salts of these metals, it was considered reasonable to expect high bacteriostatic activity and some bacteriocidal activity on the part of colloidal cadmium proteinate. In order to evaluate it for such activity we prepared a reversible colloidal cadmium proteinate, which contained 5.32% cadmium. This preparation was a very satisfactory stable colloidal solution, which after vacuum desiccation, was slowly but completely reversible. It had no bacteriocidal action and only very feeble bacteriostatic action.

## EXPERIMENTAL.

Eighty-five grams of gelatin were hydrolyzed by refluxing for one hour in 300 cc. of water containing 6.8 Gm. of 48% potassium hydroxide. Upon cooling, this

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solution of hydrolyzed gelatin was filtered with the assistance of a few grams of Kieselguhr. To this solution was added dropwise, a solution of 11.8 Gm. of cadmium nitrate dissolved in 50 cc. of water, with vigorous mechanical agitation. The resulting colloidal cadmium proteinate was desiccated, whereupon 58 Gm. of dry powder containing 5.32% cadmium was obtained.

Even in 4% solution this colloidal cadmium proteinate had no germicidal activity against *Bacillus typhosus* or *Staphylococcus aureus*. The growth of *Bacillus typhosus* was restrained in dilutions of 1/1000 but not by 1/1500. The growth of *Staphylococcus aureus* was restrained in dilutions of 1/300 but not by 1/400.

We gratefully acknowledge the assistance of our Biological Research Laboratories in determining the germicidal activity of this preparation.

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### A VITAMIN E UNIT.\*

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In the case of vitamin E it seems desirable to express the findings in the unit which shall be somewhat comparable to the units adopted by the U. S. Pharmacopœia for vitamins A and D. This is not now the case with numerous reports that have come to our attention concerning an evaluation of the vitamin E potency of a given product, particularly wheat germ oil.

Essentially, it is attempted to discover the amount of product, say wheat germ oil, that must be fed daily throughout the period of gestation to insure a litter of rats from a mother known to have been vitamin E depleted. Not unusually the total number of milligrams of test product required throughout the period, for example, 525, is used to express the vitamin E content of the oil; a 525-milligram oil. Others prefer to indicate the number of milligrams fed daily, a 25-milligram oil.

Unfortunately, these methods of expression are not alone confusing one with the other, but are contrary to the expression of vitamin A and D units in the sense that a "400-milligram oil" contains considerably more vitamin E than a "600-milligram oil," thus giving rise to the awkward interpretation of a more potent oil showing a lower numerical value. Since vitamin E threatens to become as popular in pharmacologic usefulness as vitamins A and D, it seems to us desirable to adopt a method for reporting vitamin E units that would be constant with that used by the Pharmacopœia in the cases of A and D.

The details of the method for determining vitamin E will be the subject of a separate contribution and are centered largely around the original methods proposed by Evans, Bishop and Burr. When 25 milligrams of cold pressed wheat germ oil are required daily throughout the period of gestation to insure a litter of rats in a mother definitely known to have been vitamin E depleted, we prefer to describe this as a 40-E oil. The figure is arrived at merely by dividing 1000, the number of milligrams in a gram, by 25, the number of milligrams of the test product required daily to perform biologically; and thus, the expression "40 units per gram" is in keeping with the expression "600 units per gram" of vitamin A, or "85 units per gram" of vitamin D. Of course, this method of expression agrees more

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