

insight into the complex mechanism of the aging, and more work is being done to investigate various phenomena and to experimentally test the interpretations presented.

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UTERINE RESPONSE TO DIHYDROTHEELIN¹

It has been observed for many years that the estrogenic hormones from any source caused a considerable thickening in the epithelium of the vagina and the development of a cornified layer of epithelium in experimental animals. Stockard and Papanicolaou² noted this while working with guinea pigs in 1917. Allen and Doisy³ used this observation to develop a simple test for the estrus condition—namely, the vaginal smear method. Since then the method has been refined by various workers and is widely used. Fee, Mirian and Parkes,⁴ Zondek^{5, 6} and others have shown that estrogenic substances cause marked hypertrophy of the uterus and early vaginal introitus in immature females.

Dorfman, Gallagher and Koch⁷ have suggested that quantitative observations on the hypertrophy of the uterus be used to distinguish between the estrogenic compounds. Twenty-five day-old rats were injected daily for five days with the assayed estrogenic substance. They were then sacrificed, and weights of both the uteri and the ovaries were determined. The ratio of uterine weight (mg) to animal body weight (gm) less the gut was plotted against the dosage in rat units. Theelin and theelol compared in the same way showed a marked difference in their effects upon uterine growth.

Ralls and Jordan,⁸ D'Amour and Gustavson,⁹ Thayer, Jordan and Doisy¹⁰ and later MacCorquodale, Thayer and Doisy¹¹ have reported the presence of an estrogenic compound in the follicular fluid of the ovary. Using its properties as a basis of opinion the

latter named authors suggested that the reported compound was dihydrotheelin.

As was stated above, Dorfman, Gallagher and Koch,⁷ suggest that the uterine response is a good test method to distinguish between the various estrogenic compounds. It was decided to compare the standardized international theelin and dihydrotheelin in this respect. The technique used was that suggested by D'Amour and Gustavson,¹² theelin assayed 0.84 γ per rat unit; dihydrotheelin assayed 0.154 γ per rat unit. These preparations were incorporated in olive oil for injection. Olive oil was injected in controls. Litter mates were selected for each test. Dosages of .05, .1, .2, .3, .4, .5 and .6 rat units were used. The number of animals receiving dosage for each substance varied from three to ten.

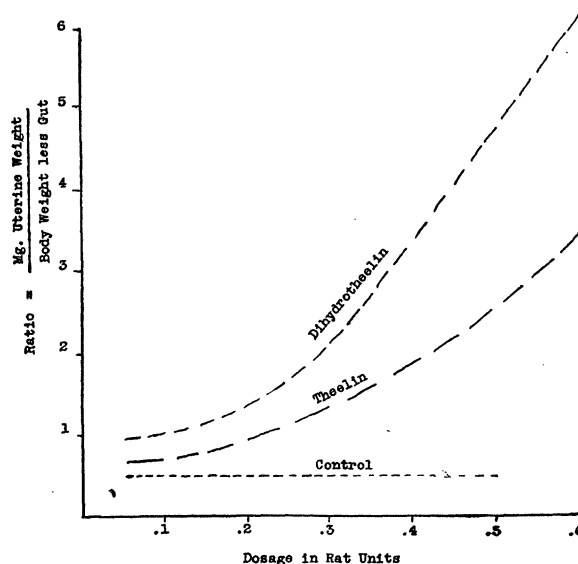


FIG. 1. Uterine response to theelin and dihydrotheelin.

By reference to Fig. 1, it can be seen that dihydrotheelin had a much greater effect upon hypertrophy of the uterus than theelin did. This is considered reasonable upon the basis of relative activity of the two as reported by several workers.

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THE VITAMIN C CONTENT OF THE HUMAN TONSIL¹

THE tonsils of 54 persons, mostly children, were analyzed for vitamin C on the day of operation by the method used for foods by Birch, Harris and Ray.² Values ranged from 10.6 to 47.6 milligrams per 100

¹² F. E. D'Amour and R. G. Gustavson, *Jour. Pharm. and Exp. Therap.*, 40: 473, 1930.

¹ Preliminary report.

² T. W. Birch, L. J. Harris and S. N. Ray, *Biochem. Jour.*, 27: 590, 1933.

¹ Contribution No. 221, Department of Chemistry, Kansas State College.

² C. R. Stockard and G. N. Papanicolaou, *Am. Jour. Anat.*, 22: 225, 1917.

³ E. Allen and E. A. Doisy, *Jour. Am. Med. Assoc.*, 81: 819, 1923.

⁴ A. R. Fee, G. F. Mirrian and A. S. Parkes, *Jour. Physiol.*, 67: 377, 1929.

⁵ B. Zondek, *Nature*, 133: 209, 1934.

⁶ B. Zondek, *Nature*, 133: 494, 1934.

⁷ R. I. Dorfman, T. F. Gallagher and F. C. Koch, *Endocrin.*, 19: 33, 1935.

⁸ J. C. Ralls and C. N. Jordan, *Endocrin.*, 10: 273, 1926.

⁹ F. E. D'Amour and R. G. Gustavson, *Jour. Pharm. and Exp. Therap.*, 49: 141, 1935.

¹⁰ S. A. Thayer, C. N. Jordan and E. A. Doisy, *Jour. Biol. Chem.*, 79: 53, 1928.

¹¹ D. W. MacCorquodale, S. A. Thayer and E. A. Doisy, *Proc. Soc. Exp. Biol. and Med.*, 32: 1185, 1935.

grams of tissue. The mean for the entire group was 24 milligrams, with a standard deviation of 6.4 milligrams.

Estimates were made of the vitamin C content of the diets which the patients had been receiving prior to operation and the results suggested a relationship between the vitamin C content of the diet and that of the tonsils.

In order to further study the effect of the vitamin C content of the diet and to determine how much vitamin C the tonsil tissue is capable of taking up 3 children (ages 3 to 6), who were hospital patients convalescing from infectious diseases and who were to have their tonsils removed, were given 400 cubic centimeters of orange juice daily for periods of from 5 to 12 days before their operations. The tonsils of these children contained an average of 42.9 milligrams of vitamin C per 100 grams of tissue.

The urinary excretion of vitamin C was determined in the case of one of the above children on the day before operation. The child received 200 cubic centimeters of orange juice at 8 A.M. and 200 more at 10 A.M. This amount of juice contained approximately 240 milligrams of vitamin C, of which 140 milligrams was excreted in 24 hours. Since this patient had received this same amount of orange juice for 11 previous days his tissues must have been saturated with vitamin C at the time of operation.

It is suggested that the vitamin C content of the tonsils may be used to indicate the vitamin C content of the tissues.

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CYTOGENETIC NOTES ON COTTON AND COTTON RELATIVES. II

CONSIDERABLE effort has been made to produce hybrids between morphologically distinct groups of *Gossypium* with a view of determining their phylogenetic relationships through cytological behavior. Recently hybrids between (1) wild species of *Gossypium* and between (2) wild and cultivated cottons have been described,^{1,2,3} but their meiotic behavior has been reported in only a few cases.

The present note deals with F_1 hybrids involving: (1) cultivated American species; (2) cultivated Asiatic species; (3) wild American species; (4) a wild Asiatic species, *Gossypium Stocksii* M. Mast.; (5) a wild African species, *G. anomalum* Wawra and Peyr.; (6) a wild Australian species, *G. Sturtii*

F. v. M.; (7) *Thurberia thespesioides* A. Gray, a wild American plant, closely allied to *Gossypium*. Each of these groups, with one exception, has the haploid chromosome number 13; in the cultivated American group the haploid number is 26.

This is the first cytological report on the hybrids discussed below; most of which represent hitherto unreported combinations between groups. The chromosome complement at the reduction division is generally composed of: (a) 13 pairs in hybrids between cultivated Asiatic species and *Gossypium anomalum*, and in hybrids between wild American species and *Thurberia thespesioides*; (b) 13 pairs and 13 single chromosomes in hybrids between cultivated American species and *Thurberia thespesioides*, and in hybrids between cultivated American species and *G. anomalum*; (c) from 0 to 8 pairs with from 10 to 26 single chromosomes in hybrids between cultivated Asiatic species and *G. Stocksii*, and between cultivated Asiatic species and *G. Sturtii*; (d) 26 single chromosomes in hybrids between cultivated Asiatic species and *Thurberia thespesioides*.

Since the haploid complements of *Thurberia thespesioides* and the wild American species are cytologically homologous, and those complements of *Thurberia thespesioides* and the cultivated Asiatic species are not homologous, we may assume that the complements of the wild American species and the cultivated Asiatic species are likewise non-homologous. Hence, the above findings give support to Skovsted's assumption that the cultivated American cottons were derived from a cross between a wild American species and a species having a chromosome complement similar to that of the cultivated Asiatic cottons.⁴ The fact that the complement of *Thurberia thespesioides* is cytologically homologous with the complement of wild American species and with a part of the complement of the cultivated American species strongly supports the view that *Thurberia thespesioides* is congeneric with *Gossypium*.

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⁴ A. Skovsted, *Jour. Gen.*, 28: 407-424, 1934.

BOOKS RECEIVED

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¹ A. Skovsted, *Jour. Gen.*, 30: 397-405, 1935.

² A. Skovsted, *Jour. Gen.*, 30: 447-463, 1935.

³ J. M. Webber, *Jour. Agr. Res.*, 51: 1047-1070, 1935.