

This method of producing ulceration is similar to some described by other workers, but to the best of the writer's knowledge no acute experiments of this type have been extended over a period of 12 hours and no ulceration or perforation was previously observed. The extremely important rôle of pepsin in the etiology of ulcer is indicated. The mechanism by which aluminum hydroxide and aluminum phosphate protect the intestinal mucosa may be studied *in vivo* by this technic.

We intend to apply the same method of perfusion to other parts of the gastro-intestinal tract.

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Comparative Activity of Naturally Occurring Estrogens on the Infantile Rat Uterus and Vagina.* †

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In a previous report it was shown that there is a distinct difference between estrone and estriol in their respective abilities to cause hypertrophy of the infantile rat uterus and vaginal introitus.¹ These observations have been confirmed and extended by other workers to include estradiol.^{2, 3} In this communication we have further extended these comparative studies to include, in addition to estrone, α -estradiol, and estriol, the benzoates of estrone and estradiol and also equilen and equilenin.

The estrogens employed in this study were dissolved in olive oil so that the daily amount administered was always contained in 0.2 cc of oil. Twenty-five-day old female rats were injected subcutaneously once daily for 5 days. Twenty-four hours after the last injection, the animals were sacrificed. Body weight, uterine weight, and vaginal

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¹ Dorfman, Ralph I., Gallagher, T. F., and Koch, F. C., *Endocrinology*, 1935, **19**, 33.

² Marlow, H. W., *Science*, 1936, **84**, 377.

³ Lauson, H. D., Heller, C. G., Golden, J. B., and Sevringhaus, E. L., *Endocrinology*, 1939, **24**, 35.

TABLE I.

Estrogen	Daily dosage in μg	No. of animals	Uterine ratio*		Vaginal Introitus %
			Extremes	Mean	
0	0	10	0.49-0.72	0.65	0
α -Estradiol	0.01	5	0.60-1.0	0.85	40
	0.02	4	0.98-1.6	1.3	63
	0.06	4	1.80-2.3	2.1	100
	0.25	4	1.70-3.6	2.6	100
α -Estradiol-benzoate	0.07†	4	1.50-2.4	2.0	25
	0.14†	4	1.90-2.6	2.2	100
	0.29†	4	2.60-3.0	2.8	100
Estrone	0.14	5	0.92-1.2	0.99	30
	0.21	5	1.20-2.1	1.7	100
	0.39	5	2.20-7.8	5.1	100
Estrone-benzoate	0.14†	7	0.60-0.79	0.70	0
	0.28†	5	0.85-1.0	0.98	0
Estriol	0.55	5	0.76-1.0	0.86	60
	5.50	5	0.85-1.1	1.00	100
	16.50	5	1.00-1.2	1.10	100
	55.00	3	1.20-2.1	1.70	100
Equilin	0.17	5	0.99-1.5	1.2	70
	0.35	5	1.40-2.3	1.5	90
	0.50	4	2.60-3.2	2.8	100
Equilenin	0.17	5	0.57-0.70	0.64	0
	0.35	5	0.78-0.86	0.82	0
	0.50	5	0.71-1.30	0.99	20
	0.80	5	0.80-1.40	1.10	80
	1.00	5	1.10-2.20	1.60	100

*Uterine Ratio — $\frac{\text{Uterus in mg}}{\text{Body weight less gut in g}}$
†Represents weight of free estradiol.
‡ " " " " " estrone.

introitus were determined. At each concentration for each estrogen 4 or more animals were used, except in one instance (estriol at 55 γ per day) when 3 animals were employed.

The comparative uterine and vaginal activities of the estrogens studied are presented in Table I and Fig. I. α -Estradiol ranked as the most active estrogen in its ability to hypertrophy the uterus and produce vaginal introitus. As small a daily dose as 0.01 μg produced a 30% increase in uterine weight and 40% vaginal introitus. The descending order of uterine activity was α -estradiol, estrone, equilin, equilenin, and estriol. The descending order of activity on the vagina was α -estradiol, estrone, equilin, with estriol and equilenin being the least active of the group and of about the same magnitude.

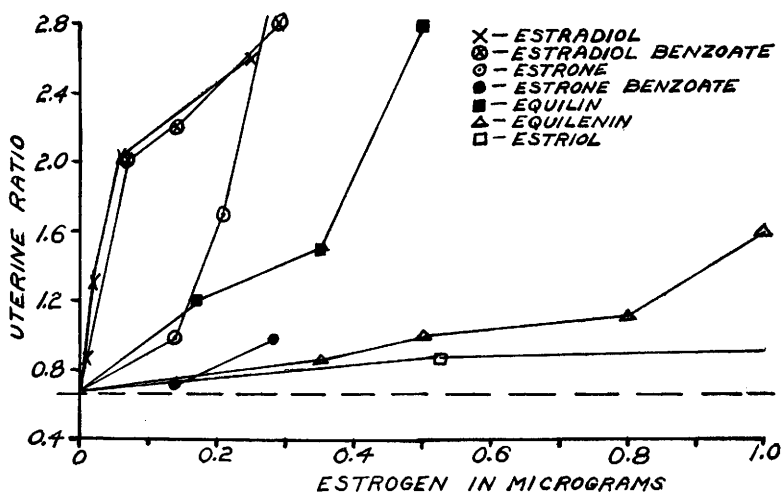


FIG. 1.

The comparative activity of naturally occurring estrogens on the infantile rat uterus. The Uterine Ratio represents the ratio of the uterus in mg to the body weight in g.

As previously described, the activity of estriol on the uterus is unique. Though a small dose stimulates the uterus, even a large dose (100 γ) still does not hypertrophy the gland to its maximum size.

Under the conditions of the experiment, the uterine and vaginal activity of α -estradiol and its monobenzoate were of approximately the same magnitude, whereas estrone was definitely more active than its monobenzoate. The reason for this difference is not at the present apparent.

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Respiration of Isolated Liver and Kidney Tissues from Adrenalectomized Rats.

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After adrenalectomy the basal metabolism of rats is depressed. It is possible that the depression is the result of metabolic disturb-