similar experiments with the collection of adrenal venous blood suggest, however, that decreased elimination is not a main factor. In the case of transfusion and infusion experiments with dog Ringer-dextran, the steep slope of the plasma curve indicates that if the rate of elimination were a main factor, the increase of rate required is too great to be likely. Therefore our results suggest that the mechanism by which aldosterone secretion is regulated operates with a latency of a few minutes in relation to changes in the blood volume.

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Oestrogen Antagonisms: 19-Norprogesterone and 18,19-Dinortestosterone as Oestrone Antagonists

CLEAVAGE of the angular methyl group at carbon-10 of the testosterone molecule results in a compound that is much more potent than the parent as an oestrogen antagonist (unpublished work) and myotropic agent¹, but not as an androgen¹. Since 19-norprogesterone has been known as a potent progestational agent for some years² and 18,19-dinortestosterone has recently been synthesized by Dr. W. F. Johns, of the Division of Chemical Research, G. D. Searle and Co., these two materials have been examined as antagonists of oestrone-induced vaginal smear changes in spayed mice.

The assay will be described in detail elsewhere (unpublished work). Spayed, adult, female mice were selected from a colony and injected with a total dose of 2 μ gm. of oestrone, given in four equal, daily, subcutaneous injections over a 4-day period. Vaginal smears were taken on the afternoon of day 5 and morning of day 6, and were scored as positive if no leucocytes were present³. The standard dose of oestrone produced 80–100 per cent positive responses in various tests with 10–15 mice in a group. Comparisons between and among compounds were made

at the dose-level that was estimated to produce a 50 per cent depression in this response.

19-Norprogesterone is some thirteen times more potent than progesterone as an antagonist of the vaginal smear effects of oestrone (Table 1). 18,19-Dinortestosterone had no effect on the proportion of positive responses at doses up to 1,000 μ gm. (This dose of 18,19-dinortestosterone produced slight but significant inhibition of the uterine growth stimulated in immature mice by 0.3 μ gm. of oestrone.)

The high potency of 19-norprogesterone correlated well with previous results in which the 19-nor-configuration was more potent than the natural form (unpublished work). The absence of activity of 18,19-dinortestosterone is of particular interest; cleavage of the angular methyl group at carbon 10 increases the potency of testosterone (80–170 per cent, unpublished work) as an oestrone antagonist, whereas with the further cleavage of the methyl group at carbon 13 activity is largely lost.

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RADIOBIOLOGY

Lead-210 in Some Human and Animal Tissues

IN two recent publications^{1,2} measurements have been reported of the levels of lead-210 (radium-D) in the bones of non-occupationally exposed American subjects. In the present communication similar findings are reported for some human and animal bone and liver specimens from Great Britain.

Six samples of bone, obtained from subjects who had died of malignant disease, were analysed for both total lead and lead-210. The specimens were dry ashed at 470–500° C., using lead-free concentrated nitric acid as an ashing aid. After solution of the ash in lead-free hydrochloric acid, lead was extracted with diethyl-ammonium diethyl-dithiocarbamate at pH 0.1 and then estimated colorimetrically using dithizone, lead-210 being estimated afterwards by low-background beta counting of the daughter bismuth-210, which was separated from lead with cupferron (to be published). The results are given in Table 1. It will be seen that the mean stable lead concentration was 6.3 μ gm./gm. bone, in good agreement with the value of 6.6 μ gm./gm. found by

Table 1. EFFECTS OF PROGESTERONE, 19-NORPROGESTERONE AND 18,19-DINORTESTOSTERONE AS ANTAGONISTS OF THE VAGINAL SMEAR EFFECTS OF 2 μ GM. OF OESTRONE

Dose : oestrone 2 μ gm. + other steroid	Progesterone :			19-Norprogesterone :			18,19-Dinortestosterone :		
	No.	No. positive	Per cent positive	No.	No. positive	Per cent positive	No.	No. positive	Per cent positive
0	33	30	91	29	28	97	14	14	100
1				13	12	92			
3				13	11	85			
10				27	13	48			
30	28	21	75	26	8	31	14	12	86
100	35	30	86	1	1	7	14	14	100
300	36	19	53	14	0	0	15	15	100
1,000	25	12	47	14	0	0	14	14	100
	17	0	0						

Approximate ED_{50} : progesterone, 180 μ gm.; 19-norprogesterone, 14 μ gm.; 18,19-dinortestosterone, >1,000 μ gm.

Table 1

Tissue	Stable lead (μ gm./gm. wet bone)	Lead-210 (picocurie/gm. wet bone)
Human vertebra	6.8	0.026
Human vertebra	4.4	0.029
Human vertebra	8.9	0.025
Human vertebra	8.7	0.034
Human vertebra	4.0	0.022
Human tibia	4.5	0.021
Mean	6.3	0.026
Ox bone (shaft)	3.8	0.26
Ox bone (shaft)	2.4	0.24
Mean	3.1	0.25