from isolated loops of dog's ileum the osmotic activity of the loop fluid normally decreases. The total osmotic pressure may fall to a half atmosphere below that of the blood plasma, even when the major solute constituents of the fluid show changes in concentration opposite to those expected on the basis of simple diffusion. These observations appear to leave no doubt as to the occurrence of active osmotic work in intestinal absorption, but they do not permit conclusions concerning the mechanism by which it is performed.

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Some Effects of Menopause Urine Extract on Sexual Organs of Immature Female Cats.

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It has been shown that menopause urine extract is capable of inducing estrus in the mature anestrus cat.[1] Mature and immature cats (ages not stated) have shown a similar reaction when FSH was administered.[2] Bourg[3] reported that in 2 immature cats of 45 days of age and in 2 cats of 15 days of age the ovaries were capable of responding to pregnancy urine extract. Our work was undertaken to study the effect of menopause urine extract on the immature female cat of known age with reference to the general effect on the ovary and uterus.

Menopause urine (pooled samples) was acidified with glacial acetic acid and precipitated with 95% alcohol. The precipitate was washed with ether and stored as a powder. This single batch of material was used for all experiments. The powder was dissolved in distilled water, as needed, and injected subcutaneously. Mature cats re-

1 Collings, W. D., Ph.D. Thesis Princeton Univ. Library, 1938; PROC. SOC. EXP. BIOL. AND MED., 1939, **40**, 679.

2 Foster, M. A., and Hisaw, F. L., *Anat. Rec.*, 1935, **62**, 75.

3 Bourg, R., *Compt. Rend. Soc. Biol.*, 1932, **111**, 148.

spond to a daily dosage of 20 r.u. of this hormone per kilo body weight.[1] A 20 or 25 r.u. dosage was used and a fairly comparable total dosage was administered in all cases.*

Twelve immature female cats, 6 to 13 weeks of age, were employed in these experiments, of which 4 served as controls, 3 of which were litter-mates in the groups in which they served. The 4 control animals varied in age from 6 to 12 weeks, but all exhibited a corresponding condition. The vaginal smears consisted of epithelial cells and a few leucocytes. The uterus was very small and the endometrium showed only slight glandular development (Fig. 2). The ovaries showed only small vesicular follicles (Fig. 1).

The uterine condition of the experimental animals closely paralleled the state of the ovary. Good stimulation of the ovary (Fig. 3) was accompanied by hypertrophy of the myometrium and a typical estrus endometrium with a good glandular development (Fig. 4). The presence of lutein tissue in the ovary (Fig. 5) resulted in a pseudopregnant endometrium in which the glands extended to the myometrium. The glands were lined with tall columnar epithelium and appeared to be actively secreting. Sixteen days after the last injection the endometrium was only beginning to regress from a pseudopregnant phase (Fig. 7). In animals where only one ovary responded and the stimulated ovary was removed, a rapid regression of the endometrium was observed.

Two cats (5, 22) 8 weeks of age were given a total of 260 r.u. of extract. Vaginal smears became cornified on the 12th day after the start of injections and infiltration of leucocytes resulted 4 days later. These were the only cases in which completely cornified smears occurred. Cat 5 was sacrificed but showed only a slight response with the development of a cystic follicle in 1 ovary. The other cat (22) was operated 14 days after the last injection. The right ovary and a portion of the corresponding uterine horn was removed. Although the ovary did not exhibit stimulation at this time, the regression of a stimulation of the endometrial crypt glands was observed. Five days later, a second series of injections was begun in which 220 r.u. were given in 12 days, the cat being sacrificed on the 16th day. The left ovary contained 4 follicles, one of ovulating size with what appeared to be a normal ovum (Fig. 6). No corpora lutea were present.

Two animals (20, 21), 11 weeks of age, received 215 r.u. in 10 injections. Two days later the right ovary and a portion of the

* One rat unit was the minimum amount which, when injected twice daily into 30-day-old female rats for 3 days, would produce only large follicles in 96 hours.

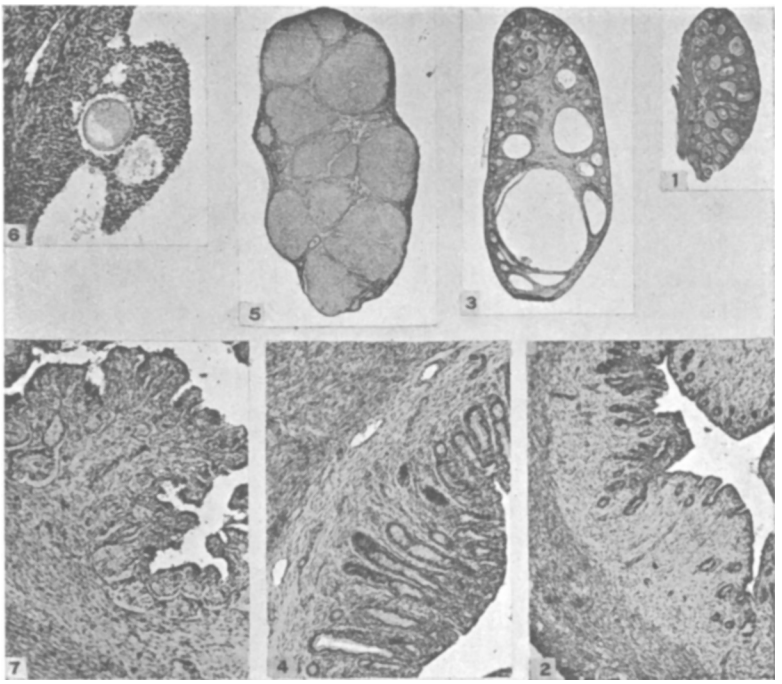

FIG. 1. Normal ovary of immature cat (No. 6). ×4.
FIG. 2. Normal uterus of immature cat (No. 6). ×45.
FIG. 3. Right ovary of cat No. 22G showing one large follicle containing a normal ova and several smaller follicles. ×4.
FIG. 4. Uterus (right) of cat No. 22G showing endometrium of the estrus type with extensive glandular development. ×45.
FIG. 5. Left ovary of cat No. 12 at the time of sacrifice showing extensive corpora lutea development. ×4.
FIG. 6. Ova, apparently normal, shown in follicle of ovary in Fig. 3. ×55.
FIG. 7. Uterus of cat No. 12 at the time of sacrifice. Endometrium is regressing from the pseudopregnant type. ×45.

uterus was removed. Gross observation of the left ovary failed to indicate any stimulation. Cat 20 had not responded, but cat 21 had one large follicle in the right ovary and no corpora lutea. Two days later, both animals were subjected to a second series of injections and received 20 r.u. daily for 12 days and were sacrificed 4 days later. Again cat 20 failed to respond although having received a total of 455 r.u. The other cat (21) did not exhibit follicle stimulation in the left ovary, but a small amount of lutein tissue was observed. Thus, a second series of injections failed to initiate a response in a cat which had not responded to the first test. Cat 21 failed to show follicle stimulation in the left ovary as a result of further treatment although the right ovary had responded to the initial injections.

Two 7-week-old cats (12, 13) were given 25 r.u. daily for 6 days and after a lapse of 4 days were given 7 daily injections of 20 r.u. On the 4th day after the last injection, both animals were operated and the right ovary and a portion of the uterus was removed. In cat 12, the ovarian weight increased four-fold over the average control weights for one ovary. Gross observation of the left ovary revealed stimulation. The right ovary had one large follicle, but consisted mostly of lutein tissue, much of which was atretic corpora lutea. Fourteen days after the operation, the animal was sacrificed, no injections being given during this period. The left ovary contained a few follicles with thickened granulosa, but in the main was composed of corpora lutea. As many as 10 corpora were present in one section. The pseudopregnant state was maintained for a much shorter time than apparently exists in normal pseudopregnancy although the corpora lutea showed no evidence of vacuolation. The other cat (13) had one large follicle covering most of the surface of the right ovary at the time of removal, while the left ovary did not appear to be stimulated. The right ovary revealed a large cystic follicle and 2 smaller normal follicles with thickened granulosa. This animal was sacrificed 9 days later and the left ovary failed to exhibit stimulation. The markedly regressed endometrium indicated the absence of ovarian secretion. Thus, again, the right ovary had responded whereas the left ovary had not.

There was no indication that ovulation had occurred in any of the experimental animals.

One cat (23G), 6 weeks of age, was injected with a total of 160 r.u. in 9 days. This animal did not react to treatment. A 13-week-old cat (19G), which had received 220 r.u. in 12 days also failed to respond.

Summary and Conclusions. Five of 8 immature female cats, 6 to 13 weeks of age, responded to menopause urine extract with follicle stimulation although lutein tissue predominated in one case. Ovarian weight increased as much as four-fold as compared to 4 immature controls. In general, the right ovary responded to a greater extent than did the left ovary. In 2 cases, the left ovary had not responded, whereas the right ovary was stimulated. A second series of injections failed to initiate a response in one cat which had been negative to the first test and the left ovary of another cat failed to respond to further injections although the right ovary had responded to the initial treatment. This lack of uniformity in response appeared even between members of the same litter. It would appear that neither the general condition nor the age of the animal was the factor determining the response, but rather some property peculiar to the individual ovary.

A typical estrus endometrium was associated with follicle stimulation whereas a pseudopregnant development was obtained in the presence of lutein tissue in the ovary. However, regression from the pseudopregnant phase was observed 16 days after the last injection.

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Xylose as a Cataractogenic Agent.*

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Mitchell and Dodge first reported the occurrence of cataract in rats fed rations containing large quantities of lactose.[1] It appears probable that the galactose portion of the lactose molecule was the causative agent.[2, 3, 4] It has been stated that galactose is a unique causative agent in the experimental production of lens opacities in the rat.[5] Other carbohydrates which have been adequately investigated for possible cataractogenic activity are glucose and fructose and substances which yield only these 2 monosaccharides upon hydrolysis. We have therefore undertaken the investigation of other less common monosaccharides with respect to this property.

Rats weighing 32-47 g and 21-22 days of age were given diets consisting of 18% casein, 3% salt mixture, 2% cod liver oil, 6% butter fat, 10% dried yeast, 26% cornstarch, and 35% monosaccharide. Glucose, galactose, and xylose were used in this series. The C. P. galactose was obtained from Pfanstiehl Chemical Co. Two lots of xylose were used; the technical grade (Pfanstiehl) was used in the diets of 12 rats and a sample of C. P. xylose (Pfanstiehl) was given to 4 rats. Five litters of rats were used, 2 from a Wistar strain of albinos and 3 from a strain of black and white

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