the implants, all of the processes of gastrulation and the formation of the primitive embryonic structures (somites, gut, nervous system and optic vesicles) were accomplished within the 12 hours immediately following the implantation operations. During this 12-hour period, the Triturus eggs barely completed the latter part of the processes of gastrulation. The differentiation of the induced Triturus structures was stimulated by an organizer in which the developmental processes were proceeding at a greater rate and at a more advanced period of time than the corresponding processes in the Triturus organizer. It may be inferred that the rate of reaction of the differentiating cells is inherent within those cells, whatever the rate of action of the organizing system. Further experiments are necessary to answer the problems concerned with time-relationships between organizing and responding cells.

Many of the problems formerly attacked by xenoplastic grafting can now be subjected to new analyses by interclass embryonic grafting. The demonstration of the compatibility between embryonic fish and amphibian cells and the capacity of fish-organizer to induce amphibian structures renders possible further attack upon interrelationships between the organizer and the cellular system responding to its stimulation.

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Quantitative Relation Between Follicle Stimulating and Luteinizing Effects in Castrate and Menopause Urine.

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We have reported[1] the observation that both follicle stimulating and luteinizing effects could be produced with urine obtained from castrates and women past the menopause. Numerous investigators (Zondek,[2] Hamburger,[3] Leonard and Smith,[4] and Col-

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1 Frank, R. T., Salmon, U. J., and Friedman, R., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 1666.

2 Zondek, B., *Hormone des Ovariums und des Hypophysenvorderlappens*, 2nd Ed., Wien, J. Springer, 1935.

3 Hamburger, C., *Acta Path. et microbiol. Scandinav.*, suppl., 1933, **17**, 1.

4 Leonard, S. L., and Smith, P. E., *Am. J. Physiol.*, 1934, **108**, 22.

lip[5]) have described strictly follicle stimulating response to the extracts of urine of castrates, in sharp contrast to that obtained with the urine of pregnancy in which luteinization was regularly noted. On the other hand, Österreicher,[6] Lassen and Brandstrup,[7] Evans,[8] and ourselves,[1] have demonstrated luteinizing effects with castrate urine extracts.

During the course of the investigation of a group of 43 cases we noted that extracts prepared from urine specimens collected from the same patient on different days produced follicle stimulation or luteinization, or combinations of both effects with equal amounts of the extracts. This led us to search for the cause or causes responsible for these variations in ovarian response. A group of 23 cases (17 surgical castrates, 3 X-ray castrates, and 3 physiological menopause) was selected from the larger group. This study is based on 76 extracts, all of which were shown to produce luteinization.

The extracts were prepared by our usual technique. In each case the equivalent of 100 cc. and 50 cc. from the same specimen of each patient was injected into test rats of 24-26 gm. in weight. All animals in these experiments were killed 96 hours after the beginning of the injections. Depending upon the effect produced by these trial quantities, the dosage of the same extract was either increased or decreased in another group of animals. With some extracts the equivalent of 100 cc. gave a luteinizing reaction, in others only follicle stimulation, and in still others a combination of both. When merely follicle stimulation resulted, other rats received increased dosage. If on the first trial luteinization was obtained the dosage was then decreased in other animals.

With some extracts very small variations in dosage produced striking differences in ovarian response. For example 100 cc., 50 cc. and 40 cc. gave III reaction; 30 cc. I in one instance; in another 108 cc. gave III and I, 100 cc. a I. In 48 titrations similar results between I and III could be obtained at will by using different quantities. The 3 photomicrographs demonstrate the extent and completeness of the reactions.

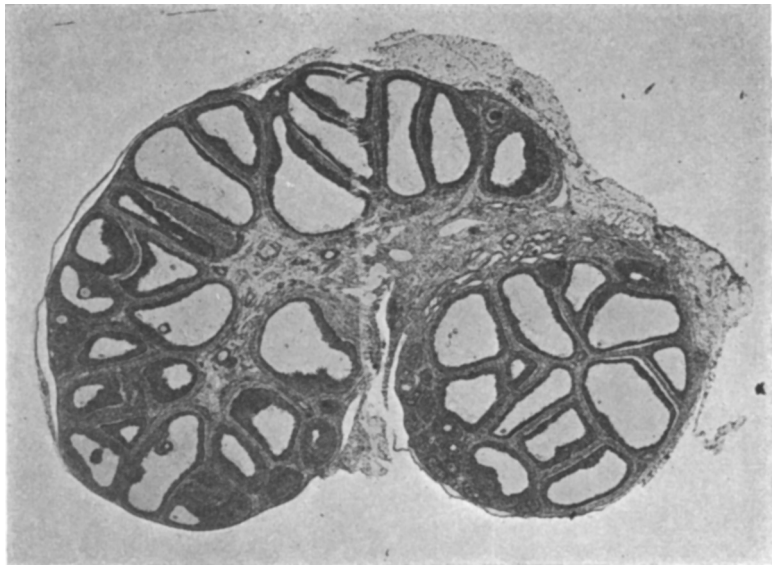
Summary: From these results it is evident that extracts pre-

[5] Selye, H., Collip, J. B., and Thompson, D. L., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 800.

[6] Osterreicher, W., *Klin. Wochenschft.*, 1932, **11**, 813; *ibid.*, 1935, **14**, 1570.

[7] Lassen, H. C. A., and Brandstrup, E., *Acta obst. et gynec. Scandinav.*, 1934, **14**, 89.

[8] Evans, H. M., and Simpson, M. E., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 1046.



FIGS. 1, 2, and 3.
Stimulation of Immature Rat Ovaries Obtained with Castrate Urine.
Fig. 1, Follicle stimulation, Reaction I.

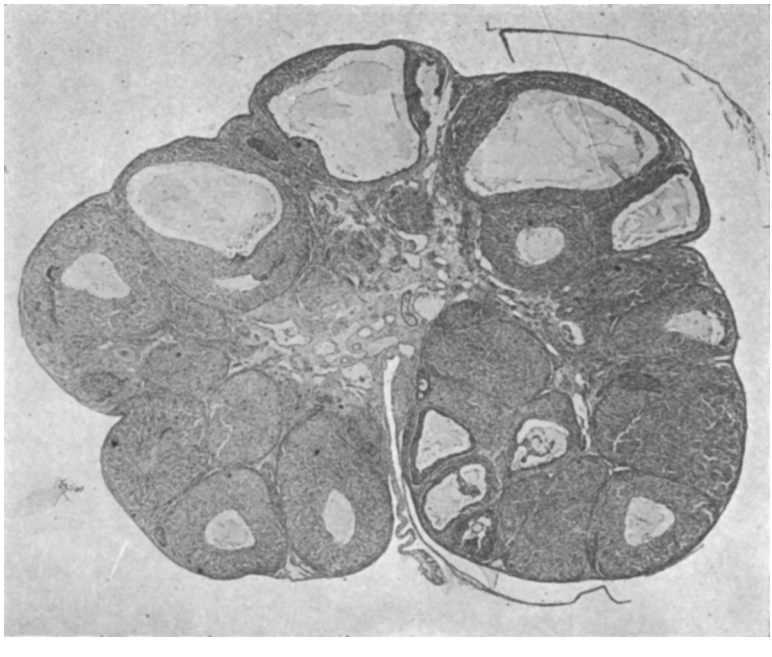


Fig. 2, Approximately equal follicle stimulation and luteinization, Reactions I and III.

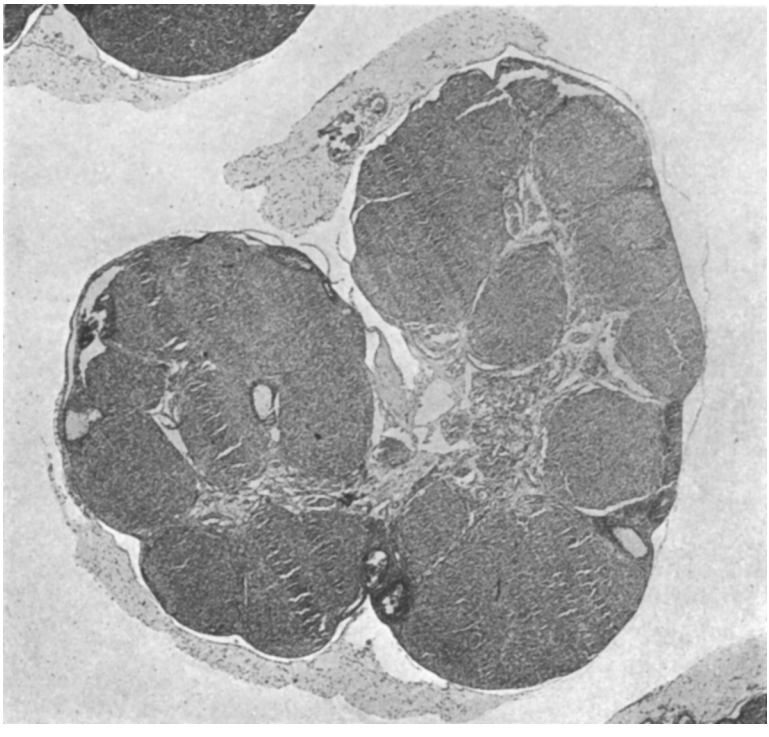


Fig. 3, Complete luteinization, Reaction III.

pared from the urine of castrates as well as those from women in the physiological menopause consistently produce both follicle stimulating and luteinizing effects. By increasing or decreasing the dosage of a given extract (in 48 specimens) we were able to produce separate effects, *i. e.*, either follicle stimulation or luteinization in immature rat ovaries. Our results do not allow us to conclude, however, whether one factor at different dosage produces both effects or whether 2 factors are present with different dosage threshholds. Further investigations to decide this fundamental question are under way.