lutea are found in ovarian grafts (immature ovaries) in castrate females but that there is "no tumultuous initiation of cycles and the grafts have only a short duration." In the present experiment the grafts were able to maintain the cyclic functions for 8½ months, at which time the animals were autopsied.

In only one case did the influence of the graft completely prevent formation of castrate cells in the hypophysis. In fact, in the animal which had been in constant oestrus for some time before autopsy, the hypophysis showed quite a large number of castrate cells. Haterius and Nelson[6] have shown that the mature ovarian graft is able to bring back the normal histological picture in the hypophysis of the male as well as in the female. However, our results show that the grafts of the ovary of the new-born do not as a rule maintain the normal condition of the hypophysis, even though they do maintain the cyclic changes in the genital system. The secondary sex characters are maintained, and the animals show varying amounts of sexual drive. They copulate quite frequently at the beginning of the cornified cell stage.

It is concluded from this experiment that the ovary of the new-born rat matures under the influence of the adult (castrate) hypophysis within 12 to 16 days, after which time it is able to maintain the cyclic changes in the genital system. However, due to the abnormal conditions of the transplantation, the ovary is able neither to ovulate nor to insure maintenance of the normal histological picture of the hypophysis. Ripe follicles and corpora lutea are not indispensable to cyclic function of the ovary.

7179 C

Observations Upon Refractory Period of Auricular Extrasystoles in the Mammalian Heart.

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By means of an adaptation of the method reported by Andrus and Carter,[1] the authors have determined the refractory period of

[6] Haterius, H. O., and Nelson, W. O., *J. Exp. Zool.*, 1932, **61**, 175.

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[1] Andrus, E. Cowles, and Edward P. Carter, *J. Exp. Med.*, 1930, **51**, 357.

extrasystoles induced at various points in the cardiac cycle in the normally beating dog's auricle. A typical experiment in which extrasystoles were induced soon after the end of the refractory period of the spontaneous excitation is summarized in Table I.

TABLE I.

	Before Adrenalin				After Adrenalin			
	Spontaneous beat		Extrasystoles produced .1470 sec. ±.0031 sec. after spontaneous beat		Spontaneous beat		Extrasystoles produced .1160 sec. ±.0053 sec. after spontaneous beat	
Columns	I	II	III	IV	V	VI	VII	VIII
Auricular rate	136		133		218		219	
	.1526	.1509	.1306	.1179	.1251	.1201	.1213	.0848
Response	.1460↓	.1446↑	.1226↓	.1138↑	.1104↓	.1159↑	.0931↓	.0800↑
	.1394	.1367	.1112	.1092	.0978	.1083	.0799	.0746
Refractory period	——	——	——	——	——	——	——	——
	.1336	.1338	.1034	.1044	.0900	.0922	.0708	.0716
No response	.1222↓	.1291↑	.0907↓	.1000↑	.0800↓	.0820↑	.0663↓	.0640↑
	.1209	.1267	.0925	.0923	.0665	.0723	.0620	.0617

↓ with decreasing and ↑ with increasing intervals. R-S_1 and S_1-S_2 intervals in seconds.

Columns I and II depict the determination of the refractory period of the spontaneous beat. The intervals, which are given in seconds, were measured between a spontaneous excitation and the induced stimulus which followed (R_1-S_1 interval). Those stimuli represented above the "refractory period" line were followed by auricular extrasystoles; those below were not. The refractory period, therefore, lay between the shortest interval which was followed by a response and the longest which was not.

Each series is made up of consecutive observations; those of Column I with successively decreasing, and those of Column II with successively increasing, R-S intervals. Identical supra-maximal stimuli were used throughout.

Columns III and IV illustrate the estimation of the refractory period of extrasystoles induced 0.1470 sec. ± 0.0031 sec. after spontaneous excitations. The intervals are those between a stimulus which produced an extrasystole and a succeeding identical stimulus (S_1-S_2 interval). The stimuli above the "refractory period" line were followed by a second auricular systole, those below were not. The refractory period of the auricular extrasystoles, therefore, lay between the extremes as defined above. These results are also from consecutive observations with successive S_1-S_2 intervals shorter in column III and longer in column IV.

Columns V, VI, VII and VIII are similar to columns I, II, III and IV, respectively, and give the results of observations made upon the same preparation during the constant intravenous infusion of adrenalin (1-25,000).

In this experiment the refractory period of normal auricular excitations was found to lie between 0.1338 sec. and 0.1367 sec. The refractory period of extrasystoles induced 0.1439 sec. to 0.1501 sec. after normal excitations was between 0.1044 sec. and 0.1092 sec. The same ratio obtained when the cardiac rate was accelerated by the constant intravenous infusion of adrenalin. The refractory period of normal excitations lay between 0.0922 sec. and 0.0978 sec. while the refractory period of early extrasystoles was between 0.0716 sec. and 0.0746 sec.

In a series of 19 animals it has been demonstrated that the refractory period of a premature systole is considerably (20-30%) shorter than that of a normal spontaneous excitation. Moreover, the earlier the extrasystole is induced in the normal diastole, the shorter is its refractory period.

Complete results of the other observations, and the significance of these findings with relation to certain ectopic rhythms, will be discussed in a subsequent communication.

7180 P

Reversible Inactivation of Bacteriophage by KCN.

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It has recently been shown that the complete inactivation of phage following treatment with $HgCl_2$ can be reversed by precipitation of Hg^{++} with restoration of the phage to its original titre.[1, 2] The phenomenon is interesting in that reactivation occurs after exposure to very concentrated $HgCl_2$ solutions for long periods of time, conditions which produce irreversible loss of the growth function in even the most resistant spore forms of bacterial life. The suggestion was advanced[2] that this behavior spoke for the enzyme concept of phage rather than for the view that phage is composed of living protoplasm.

[1] Krueger, A. P., and Baldwin, D. M., *J. Gen. Physiol.*, 1933, **17**, 129.

[2] Krueger, A. P., and Baldwin, D. M., *J. Gen. Physiol.*, 1933, in press.