trated. The mature females were sacrificed at 15 and 30 day intervals after operation. Forty-one of these rats received from 25 to 75 units of an extract of pregnancy urine† daily throughout the 15 day castration period or for the last 15 days of the 30 day castration period in those rats which were sacrificed after 30 days. All immature rats were between 25 and 30 days old at operation, and were sacrificed 15 days after operation. Sixteen received 25 units of pregnancy urine extract daily for the entire period; 15 littermate sisters served as controls.

At autopsy the pituitaries were weighed and fixed in Regaud's fluid. Serial sections of all glands were cut. Complete cell counts were made on 5 sections from each of the 90 glands. A total of 331,056 cells were counted.

The quantitative results of these studies are presented statistically in Table 1. (Frequency distribution, means and standard deviations are given). Analysis of this table reveals that the percentages of the various cell types in the anterior pituitaries of the injected rats were almost identical to the percentages of these cells in the anterior pituitaries of the control rats castrated for a similar period of time. Morphologically the anterior pituitaries of the injected rats and those of the controls appeared identical. From the results of these experiments we feel justified in concluding that extracts of pregnancy urine are without action on the anterior pituitaries of castrated female rats.

7608 C

Comparative Quantitative Effects of Castration in Mature and Immature Female Rats.*

J. M. WOLFE.

From the Department of Anatomy, Vanderbilt University School of Medicine, Nashville, Tenn.

Ellison and Wolfe[1] have reported that in the anterior pituitaries of castrated mature female rats there is an increase in the percentages

† Follutein was furnished by E. R. Squibb and Sons through the courtesy of Dr. J. J. Durrett.

* These studies have been supported by the Committee for Research in Problems of Sex of the National Research Council, the Committee for Scientific Research of the American Medical Association, and the Division of Medical Sciences of the Rockefeller Foundation.

[1] Ellison, E. T., and Wolfe, J. M., *Endocrinology*, 1934, **18**, 555.

TABLE I.

Percentage of Cells	Frequency Distribution			Mean-Standard Deviation (Percent)		
	15-day castrates		30-day castrates	15-day castrates		30-day castrates
	Mature	Immature	Mature	Mature	Immature	Mature
Eosinophiles						
30.0-34.9	6	4	—	Mean 37.1	Mean 37.1	Mean 41.2
40.0-44.9	4	6	15	S. D. 3.1	S. D. 3.1	S. D. 3.8
45.0-49.9	—	—	7			
Basophiles						
5.0- 6.9	3	—	—			
7.0- 8.9	9	—	—			
9.0-10.9	11	—	4			
11.0-12.9	2	1	10	Mean 9.0	Mean 15.8	Mean 13.6
13.0-14.9	—	8	17	S. D. 1.6	S. D. 1.9	S. D. 2.0
15.0-16.9	—	13	6			
17.0-18.9	—	8	2			
19.0-20.9	—	—	—			
21.0-22.9	—	1	—			
Chromophobes						
35.0-39.9	—	—	8			
40.0-44.9	—	9	9			
45.0-49.9	2	20	16	Mean 54.3	Mean 46.3	Mean 45.0
50.0-54.9	13	2	6	S. D. 3.4	S. D. 2.6	S. D. 4.9
55.0-59.9	9	—	—			
60.0-64.9	1	—	—			
	—	—	—			
No. of rats	25	31	39			

The quantitative data are arranged in statistical form. The frequency distribution, the mean and the standard deviation of the various groups are indicated.

of the basophiles to a mean level of 9% in the 15-day castrates and 13.6% in the 30-day castrates. A few signet-ring castration cells were also found in the anterior pituitaries of the 30-day castrates. In further studies[2] we have pointed out that injection of pregnancy urine extracts† are without action on the pituitaries of mature female rats castrated for 15 and 30 days. By adding the 2 series of injected and uninjected animals together, we have to date studied and made cell counts on the anterior pituitaries of 25 mature females castrated for 15 days and 39 castrated for 30 days. These data are arranged in statistical form in Table I, in which the frequency distribution of the percentages of the various cell types, the mean and the standard deviation are given. In addition, 31 immature female rats were castrated when between 25 and 30 days of age and sacrificed 15 days later. Sixteen of these animals received injections of pregnancy urine extracts. Since these extracts were without action on the anterior pituitary,[3] data from these 31 rats are considered together and arranged statistically in Table I. For non-castrated controls we have to date made cell counts on the anterior pituitaries of 69 mature female rats killed at various periods of the oestral cycle, and 31 immature female rats killed between 25 and 35 days of age. The mean levels of the eosinophiles in the anterior pituitaries of the mature and immature controls were 33.6 and 36.1%, respectively. The standard deviations (S. D.) were 4.5 and 3.9, respectively. The mean level of the basophiles in the mature controls was 4.8% (S. D. of 1.2) and in the immature controls was 7.2% (S. D. of 1.3). The mean levels of the chromophobes were 61.9% (S. D. of 4.2) in the mature controls and 55% (S. D. of 3.2) in the immature controls.

Analysis of Table I reveals that in 25 mature female rats castrated for 15 days, the mean level of the basophiles was increased to 9% and in 39 mature females castrated for 30 days, the mean level of the cells was increased to 13.6%. (The mean level in 69 non-castrated mature females was 4.8%). Further analysis reveals that in 31 immature rats, castrated before they were 30 days of age and sacrificed 15 days after removal of the ovaries, the mean level of the basophiles was increased to 15.8%, a mean percentage which was slightly higher than that found in mature female rats

[2] Wolfe, J. M., Ellison, E. T., and Rosenfeld, Louis, *Anat. Rec.*, 1934 supplement, 58-94.

† Follutein was furnished by E. R. Squibb and Sons through the courtesy of Dr. J. J. Durrett.

[3] Wolfe, J. M., PROC. SOC. EXP. BIOL. AND MED., 1934, **32**, 184.

castrated for a period of time which was twice as great (30 days). Study of the frequency distribution of these cells in the mature and immature groups will show the individual variations in the different groups and demonstrate in a clear-cut fashion that the factor of age must be considered seriously when one is studying the reaction of the anterior pituitary of the female rat to castration. It is impossible at the present time to give an explanation of this interesting finding. It is pointed out that the initial levels of the basophiles are much higher in normal immature female rats than they are in mature females killed during the various phases of the oestral cycle. Also in the anterior pituitaries of immature female rats a great majority of the basophiles are completely filled with granules, while in the mature female these cells undergo cyclic changes in their granular content.

Reference to Table I will show that the mean level of eosinophiles in 39 female rats castrated for 30 days was 41.2% while the mean level of these cells in 69 mature normal female rats was 33.6%. This would indicate that in this group of castrates there was some increase in the eosinophiles. However, it is important to point out that occasionally the level of these cells in non-castrated females was slightly higher than 40%. Since the mean level of these cells in the 30-days castrates was only slightly above the upper limits of normal for normal females it seems questionable to conclude without additional data that castration in mature female rats results in an increase in the eosinophiles.

7609 C

Suspension Stability of Erythrocytes in Solutions of Gum Acacia.*

S. P. LUCIA AND J. W. BROWN. (Introduced by D. M. Greenberg.)

From the Division of Medicine, University of California Medical School, San Francisco, California.

It is stated that the suspension stability of erythrocytes is dependent upon variations in the albumin, globulin, and fibrinogen content of plasma.[1, 2] An increase in the fibrinogen, or globulin, tends to diminish the stability.[3] A careful study of this phenome-

* Assisted by a grant from the Christine Breon Fund.

1 Fahraeus, R., *Acta Med. Scand.*, 1921, **40**, Suppl.

2 Westergren, A., Juhlin-Dannfelt, C., and Schnell, R., *Acta Med. Scand.*, 1932, **77**, 469.