thelioid cells. In general the epithelioid cell cytoplasm was found low in ash.

As a rule regions of degeneration and recent necrosis were found to contain less ash than the corresponding undegenerated tissue. This was the case in guinea pig tubercles, acute tuberculous pneumonia in man and chronic fibrocaseous human tuberculosis. A peribronchial tubercle (guinea pig) in the corresponding stained and ashed sections is shown in the accompanying figure (Fig. 1). It will be noted that the center of the ashed tubercle contains somewhat less mineral than the outer zones, and that this region corresponds to a spot of early degeneration in the stained tubercle. It seems reasonable to attribute the loss of mineral to karyolysis and diffusion away of soluble mineral material.

In later stages of the human disease remineralization of necrotic tissue could be observed. In sections of experimental tuberculosis kindly furnished by Dr. Spies, taken from tuberculous rabbits given intensive oral treatment with viosterol, the speed of this process was found to be much enhanced (compare with other results of Spies[3]). On the other hand in 2 tuberculous guinea pigs given 50 cc. of viosterol by mouth in the course of a month in this laboratory no calcification was observed. It appears that viosterol is usually but not always effective in causing calcification in experimental tuberculosis.

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Reaction of Anterior Hypophysis of Immature Rat to Placental Hormones.*

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(Introduced by R. S. Cunningham.)

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Lehmann[1] has reported that injection of placental extracts brings about pregnancy changes in the anterior hypophysis of the female rat.

[3] Spies, T. D., *Am. Rev. Tubere.*, 1931, **23**, 169; Spies, T. D., and Berryhill, W. R., 1932, **26**, 275.

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[1] Lehmann, J., *Virchow's Arch. f. path. Anat. u. Physiol.*, 1928, **268**, 346.

Collip and his associates[2] have recently reported that long term injection of the anterior-pituitary-like hormone of the placenta brings about an enlargement of the anterior hypophysis, which is later followed by a decrease.

We have carried out a series of experiments in which we have studied the histological changes in the anterior pituitaries of immature rats which had received injections of a relatively crude oestrin-free extract of placenta. The method of preparation of this extract has been described.[3] We have used litters of immature female rats, 25 to 35 days old. Half of the animals in each litter received 2 subcutaneous injections daily for 6 to 8 days. The remaining animals in the litter served as controls.

The results of the injections were constant and definite. Table I illustrates some of our findings and shows that the ovaries of the injected animals were markedly increased in size.† The swollen and hyperemic pituitaries of the injected animals exhibited a moderate but invariable weight increase when compared with those of the controls. The ovaries and pituitaries of all animals were weighed on a torsion balance accurate to 0.5 mg. (Hartmann and Braun). Analysis of Table I reveals that the increase in the size of the hypophysis was as a rule greatest in the animals in which the ovarian reaction was greatest, a fact already noted by Collip and associates.

Complete serial sections of the hypophyses of both the control and experimental animals were cut. One section from each ribbon of 25 was mounted, giving a complete set of sections. Every fifth or sixth slide of each set of sections was studied. Cell counts were made of each section studied. In this way we were able to calculate the relative percentage of each cell type present. The anterior lobes of the injected animals exhibited marked histological changes, when compared with the controls. Analysis of Table I reveals that injection of placental extract brings about a slight but constant decrease in the relative percentage of the cells of Type I (eosinophiles). However, the most marked changes were in the basophilic elements (Type III). In the anterior lobes of the controls, a majority of the basophiles were small and completely filled with violet or

[2] Collip, J. B., Selye, H., Thomson, D. L., and Williamson, J. E., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 590.

[3] Klingler, H., Burch, J. C., and Cunningham, R. S., *Surg., Gyn. and Obstet.*, 1933, **56**, 137.

† A similar hypertrophy has been obtained by the injection of pregnancy urine extracts (Follutein and Antuitran "S"). These extracts were kindly furnished by E. R. Squibb & Sons and Parke, Davis & Co., respectively.

TABLE I.
Changes Induced by Injections of Placental Extracts.

Animal No.	Type	Inj. period, days	Rat wt., gm.	Ovary wt., mg.	Hyp. wt., mg.	% of Cell Types				Sections counted	Cells counted
							Type III				
						Type I	Gran.	Non-gran.	Type IV		
228	Cont.	—	75	27	3.0	37.0	10.0	—	53.0	5	2,828
227	Exp.	6	72	83	3.5	34.2	3.6	4.5	57.7	3	918
231	Cont.	—	83	31	3.5	40.9	10.6	0.2	48.3	5	2,164
232	"	—	89	27	3.0	35.8	7.0	—	57.2	5	1,504
229	Exp.	4	74	91	4.0	32.5	4.1	5.9	57.5	5	1,733
230	"	4	77	87	4.0	31.4	4.1	6.0	58.5	5	1,849
233	"	6	72	100	4.5	32.3	6.9	5.6	55.2	5	2,043
307	Cont.	—	69	23	3.0	32.4	6.5	—	61.1	4	1,177
308	"	—	73	27	3.0	29.8	6.8	—	63.4	4	973
309	Exp.	6	67	83	4.0	27.5	2.5	5.5	64.4	5	777
310	"	6	68	77	4.5	25.0	3.0	6.0	66.0	4	901
311	" (Cast.)	6	69	—	3.5	33.6	10.3	—	56.1	4	1,200
312	" (Cast.)	6	70	—	3.5	33.0	10.0	—	57.0	4	1,015
351	Cont.	—	73	23	2.5	42.2	4.5	0.5	52.8	5	2,174
352	Exp.	6	70	79	3.5	30.6	2.9	6.6	59.9	4	1,530
353	Cont. (Cast.)	—	73	—	3.0	38.9	12.5	—	48.6	4	1,770
354	Exp. (Cast.)	6	70	—	3.0	36.1	11.5	0.7	51.7	4	1,972
‡	Total of sections studied and cells counted									177	65,432

dark blue granules. In the injected animals, these cells were larger but a great majority of them had lost all or a greater part of their granular material (Table I). This was a constant finding in all the injected animals. It was found that castration of the injected animals 2 to 3 days before the beginning of the injection period prevented this loss of granular material from the basophilic elements.

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Presence and Significance of Choline in Cortico-Adrenal Extract.

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The widespread occurrence of choline and its compounds in the normal organism has been regarded as an indication that it may

‡ Editor's Note: Part of table is here published to meet needs of condensation.