eral cases within three or four days of the time of castration. In no case, however, has the mammary gland been as thick as that obtained at the end of pregnancy, the thickest lactating gland obtained by this means being about one third as thick as glands obtained at parturition or a few days before.

No attempt has been made to assay the pituitaries in these rabbits to see what effect the oestrin may have had on them, but it is probable that the effect on the corpora is an indirect one, since many observers have shown that oestrin alters the gonadotropic activity of the pituitary.

These findings may explain the persistence of the corpora lutea during pregnancy in the rabbit. We have assumed, as many others working in the field of reproduction undoubtedly have also, that during pregnancy the placenta elaborates a gonadotropic hormone which, either directly or indirectly through the pituitary, causes the corpora to persist. This assumption is not based on direct evidence from the rabbit but rather by analogy because of the finding of pituitary-like substances in human pregnancy urine and placenta. In the light of these experiments it is much more likely that in the rabbit the placenta elaborates oestrin and that this rather than a placental gonadotropic hormone causes the corpora to persist.

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SOME POSSIBLE EFFECTS OF NURSING ON THE MAMMARY GLAND TUMOR INCIDENCE IN MICE[1]

FOLLOWING the publication[2] by the staff of the Jackson Memorial Laboratory (1933) on the extrachromosomal influence in the etiology of breast tumors, several experiments were designed in an attempt to determine the basis of such an effect. In this note the writer presents a preliminary report on the foster-nursing of the young cast by females of a high mammary gland tumor line by females of a low tumor stock and its possible effects on the incidence of that type of tumor.

Three litters of mice from the inbred A strain of mice, which has a mammary gland tumor incidence of 88 per cent.,[3] were fostered by females of the X stock (Strong's CBA race). The breast tumor incidence in the latter strain is approximately 10 per cent. The young were removed from their A stock mothers as soon as noticed—none were more than twenty-four hours old.

In the three litters of fostered A stock mice were nine females. They were used as breeders as well as forty of their progeny. Hence, the mice were subjected to all the irritation factors considered essential for the development of breast tumors in individuals having such an inherited constitution.

Of the nine A stock females fostered by CBA stock females, three developed mammary gland tumors, four had primary lung tumors and two died non-tumorous. Among 40 of their progeny which were not fostered, there were observed 12 with breast tumors only, two with breast and pulmonary cancers, 13 with primary lung tumors and 13 died non-tumorous. The proportion for each group was 30.6 per cent., 4.1 per cent., 34.7 per cent. and 30.6 per cent., respectively. The average age at death or observation of the various classes was: breast cancer, 12 months; lung cancer, 17 months; and non-cancer, 15 months.

Ten of the 13 progeny of fostered females which had breast cancer developed similar growths as compared with four of the 24 progeny from fostered females which had lung tumors. The respective proportions were 77 per cent. and 17 per cent.

The three fostered litters were descended from one subline of the A stock. All had from 16 to 18 successive generations of mammary gland tumors in their direct ancestry. Prior to the birth of the litters 78 mice had been observed, of which 92.3 per cent. had developed breast tumors. In later generations 219 mice, exclusive of the fostered females and their progeny, have died from various causes. The proportion developing mammary carcinoma was 88.1 per cent.

While the number of animals used in the preliminary work has been small, a larger group of females fostered by C_{57} Black stock mice are giving observations which are indicative of similar results. Should further study demonstrate that the incidence of mammary gland tumors in mice may be affected by nursing, an explanation may be offered for the so-called extrachromosomal influence as a cause in the development of this type of neoplasm.

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BONE ASH IN PREVENTION AND HEALING OF EXPERIMENTAL RAT RICKETS

THE very extensive use of rickets curative technique in judging the effects of vitamin D in both rats and human subjects, where the conclusions are based on subjective estimates of the degree of healing, makes it desirable to supplement the information, if possible, with more objective measurements.

The ash content of the normal rat femur (stock diet)

[1] Preliminary report.
[2] Staff, Jackson Memorial Laboratory, SCIENCE, 78: 465, 1933.
[3] J. J. Bittner, *Amer. Jour. Cancer*, 25: 791, 1935.