SUMMARY

1. Pregnant rats of the Fischer strain were divided into intact control, sham-operated control and experimental groups.

2. On the 18th day of pregnancy lesions were made in the nucleus accumbens of experimental rats. Sham controls were subjected to the same procedure as experimental animals except that the electrode inserted into the nucleus accumbens was immediately withdrawn without the passage through it of lesion-producing current. There was no differences in treatment of the three groups subsequently.

3. Upon delivery litters of all mothers were reduced to six pups. Weight gain of litters served as an index of the quality and quantity of milk produced and ejected by the mother.

4. A higher incidence of deaths among neonates in the experimental litter was noted. Two litters in particular were characterized by their subnormal weight (relative to the average weight of intact control litters) and early death. Unfortunately, since their weights at birth were also considerably less and the weights of the mothers too was below average, it is not possible to attribute with any degree of confidence the death of the litter to insufficient consumption or to insufficient availability of milk. The total weight for the other experimental litters did not vary
appreciably from the average control litter weight, although pups belonging to five out of the six remaining litters died by the end of their second week. At death the pups appeared emaciated and their stomachs devoid of milk. In contrast pups belonging to control litters looked well-nourished and their stomachs could be seen to contain milk.

5. The duration of gestation, labor and delivery did not appear to be affected by the lesion. Neither did the mother's nest building and retrieving capabilities.

6. Following weaning or death of their young lesioned mothers displayed receptivity to males, but no pregnancies resulted. The cause of the mothers' infertility was not determined.

7. Histological examination revealed that the greater deficiencies in litter maintenance occurred in those mother in whose lesions extended throughout the lateral portion of the nucleus accumbens and a small ventral portion of the nucleus caudatus-putamen. Fibers passing through the lesioned area presumably belong to the limbic system and connect such structures as the pyriform cortex, olfactory tubercle, nucleus septi-hippocampalis and area preoptica. Descending projections from these structures which pass through the medial forebrain bundle to the hypothalamus and midbrain 'limbic' area were probably also affected.
8. By far the greatest effect of lesions in the nucleus accumbens appeared to be the interruption of the neural pathway mediating oxytocin release and subsequent milk-ejection, the neuroendocrine reflex response to suckling.