seemed possible that a higher dosage might be the answer. However, the application of 400 r to 3 animals was absolutely ineffective, though all recovered, ovulating in the next breeding season.

The series, therefore, includes one positive case. We doubt, however, that the sudden resumption of the ovulatory function in the case of No. 466 is attributable to the treatment. Two considerations favor such a conclusion: first, the absolute refractoriness of 11 other animals; and second, the fact that in the Carnegie Colony the spontaneous "recovery", with resumption of the ovulatory function, has occurred time and again. Such females often ovulate regularly for the rest of the breeding season.

If we do not feel justified in claiming a positive effect of irradiation of the hypophysis, we may conclude, on the basis of subsequent performance of the subjects, that the treatments were not in the least deleterious.

Summary. A single dose of X-ray between 60 and 400 r administered to the pituitary gland of non-ovulating rhesus monkeys failed to cause increase of ovarian size in 11 cases. The single female which ovulated might have done so without treatment as often happens in similar cases. There were no harmful sequelæ of the treatment, for in one-third of the cases spontaneous ovulation and conception occurred in the following breeding season.

10194 P

Infundibular Lesion and Pars Intermedia Activity in the Tadpole.

WILLIAM ETKIN AND LESLIE ROSENBERG. (Introduced by G. K. Noble.)

From the College of the City of New York and the American Museum of Natural History.†

Vunder[1] reported that the transplantation of a single hypophysis into an hypophysectomized Axolotl led to an excessive development of pigmentation. He ascribed this result to traumatic stimulation in the operation and supported his view by showing that the same

* This investigation has been aided by a grant from the Josiah Macy, Jr., Foundation.

† Assistance in the preparation of these materials was furnished by the personnel of Works Progress Administration Official Project No. 465-97-3-67.

[1] Vunder, P. A., *Trans. Dynamics of Develop.*, 1931, **6**, 73.

result followed pricking the gland with a needle. In connection with the development of anterior lobe function in the tadpole, one of us[2] has confirmed and extended Vunder's findings. His interpretation, however, seemed unacceptable since it was there found that transplantation of even primordia into the embryo led to the development of the pigmentation weeks later and also because the effect often persisted as long as the animal could be kept, in many cases over 4 months. In a brief report of some of this material[3] it was suggested that the pituitary is under some restraint in its normal site, from which it is released on transplantation. It was further suggested that the source of this inhibition might be the nerve tract from the hypothalamus to the pars nervosa and intermedia. This tract usually called the supra-optico-hypophyseal tract has been found by the authors in the frog.

Recently we have been able to put this theory to a test through having developed an operative approach to the tadpole's pituitary. The operation was performed in *Rana sylvatica* tadpoles by exposing the entire dorsum of the brain, cutting the olfactory and one or both optic nerves and lifting the brain out sufficiently to make possible the manipulation of the infundibulum by the anterior approach. In the experimental animals the infundibulum was partly or completely destroyed by pinching with fine forceps and where possible plucking out part of the tissue. In the controls the infundibulum was merely slightly manipulated though the rest of the operation was carried out as in the experimentals. Thirteen experimental and 13 control animals survived the operation. The animals were kept to metamorphosis 12 to 23 days after operation.

Twelve of the experimental animals showed a pronounced darkening due to excessive melanophore expansion and xantholeucophore contraction during the first 2 days after operation. This darkening persisted for various periods in different animals and during its persistence the animals became darker and darker. In 7 animals in which the effect persisted for more than 12 days the accumulation of free pigment and the increase in number and expansion of the melanophores reached such a stage as to render the animals coal black, even the tail fin becoming partly opaque. Such animals approached in the intensity of color the extreme hyperpigmentation shown by the most successful pituitary graft animals.[2] None of the controls showed any unusual darkening.

Histological examination of the tissues of control and experi-

2 Etkin, W., *J. Exp. Zool.*, 1938, **77**, 347.

3 Etkin, W., *Anat. Rec.*, 1936, **64**, 75.

mental animals prepared by Bouin's fixation and Mallory's stain showed a general though not exact correlation between the completeness of the infundibular lesions and the degree of hyperpigmentation. In the cases of extreme pigmentation the pars intermedia was found to be enormously enlarged showing hyperplasia and cellular hypertrophy, the cytoplasm of the cells showing a marked increase in volume, density and chromophilia. These changes are similar to those shown by successful grafts.

In the light of the previously adduced evidence from grafts, this experiment is interpreted as indicating that the infundibular tracts to the pars intermedia normally inhibit its growth and secretory activity in the tadpole.

10195

Lactic Acid Formation by Muscles of Scorbutic Guinea Pigs.

OTTO RAHN.

From the Laboratory of Bacteriology, New York State College of Agriculture, Cornell University, Ithaca, N. Y.

Experiments with washed cells of *Streptococcus lactis* had shown that the rate of conversion of glucose to lactic acid is always increased by addition of peptone, or of nicotinic acid.[1] Ascorbic acid acted irregularly. It proved very efficient only with injured cells, *i. e.*, cells subjected to very long centrifugation, to heating, or to long storage at 0°C. Since the mechanism of acid formation by bacteria is similar to that by animal tissues, the effect of ascorbic acid on the acid formation by muscle of normal and scorbutic guinea pigs was investigated in the hope to find that injury caused by scurvy could be repaired by ascorbic acid.

Preparation of the muscle. Killing of the animal by a blow on the head, followed by skinning and cutting of the muscle which was thrown into solid carbon dioxide, resulted in a very high lactic acid content of the muscle although the entire operation required not more than 10 minutes.

Davenport and Davenport[2] anesthetized the animal, dissected the gastrocnemii free from surrounding tissue, leaving however, blood and nerve connections intact, and after 10 minutes of rest, froze the

1 Rahn, O., and Hegarty, C. P., PROC. SOC. EXP. BIOL. AND MED., 1938, **38**, 218.
2 Davenport, H. A., and Davenport, H. K., *J. Biol. Chem.*, 1928, **76**, 651.