

For each injection a distinct red ring was observed in the dentin and the bone that were forming and calcifying at the time.² This effect was immediate, as indicated in the animals sacrificed within a few hours after the last injection. In 6 animals 4 months elapsed between the first injection and death. This long survival did not alter the staining reaction.

Measurement of the distances between successive rings indicated the amount of apposition during the corresponding intervals. The rate of apposition of dentin based on 1164 measurements made chiefly in the ground sections of bicuspid and molars ranged from 1.6 to 5.6 μ per 24 hours. This range may be explained on the basis of a growth gradient with its maximum at the cusp and along the outer dentinal surface and its minimum apically and toward the pulp. Alizarine lines were also found in the cementum. Definite staining effects could be recognized macroscopically in the jaws and long bones.

Subcutaneous administrations were found to be complicated by a sloughing of the tissues at the site of injection. Intravenous injections gave sharper effects than intraperitoneal injections of the same dose. However, thrombosis of the veins at or near the site of injections occurred frequently. The intraperitoneal injections were as effective as the intravenous ones when the dosage was increased to 10 cc.

Preliminary experiments on rats show that intraperitoneal injections of 1 cc. of a sterile isotonic 2% solution of Alizarine Red S altered with isotonic sodium hydroxide to take effect in mammalian blood give sharp effects with little or no toxic complications and no superficial lesions. It is suggested that the preparation of an alizarine solution which would also impart radiopaque lines in the calcifying tissue would be very useful in experimental investigations.

9706

Polypneic Panting in Anesthetized Cats.

H. W. MAGOUN. (Introduced by S. W. Ranson.)

From the Institute of Neurology, Northwestern University Medical School.

In a recent series of experiments a region of the cat's brain was found which responded to local heating by acceleration of respira-

² Schour, I., *PROC. SOC. EXP. BIOL. AND MED.*, 1936, **34**, 140.

tion, panting and in some instances by the appearance of sweat on the foot pads.¹ These experiments were performed on anesthetized animals and we wish here to consider the use of anesthesia in such work.

Six experiments were performed under light nembutal anesthesia (18 mg. per kilo) with unsatisfactory results. Respiration under nembutal is slow and heating the whole animal does not lead to polypnea and panting until an abnormally high body temperature is reached. In 6 experiments the animals were prepared under ether by the insertion of a pair of electrodes into the brains and, 3 to 4 hours later, with the animals in the waking condition, heating the brain induced good polypneic panting in 3 cases, which indicates that previous etherization is not detrimental to the response. Two cats panted at a rapid rate during recovery from the anesthesia although their rectal temperatures were only 36.2°C. and 37.6°C. respectively.

Urethane does not depress respiration like nembutal, and was employed with good results in 41 experiments in a usual dosage of 1 gm. per kilo intraperitoneally. Urethane anesthesia has the disadvantage, however, of being associated in some cats with a period of polypnea and panting which may occur at a normal body temperature with no apparent external causation.

In the 41 experiments under urethane, polypneic panting in cats with relatively low rectal temperatures was encountered as a more or less initial feature in 15 cases. Eight of these 15 animals had received supplementary ether during the operative preparation and 4 had had a heating pad on during this procedure. The effect was just as marked, however, in the animals which had not received these extra attentions, and was noted to have been present in 4 cases before the operative procedure was begun. The respiratory rate during the polypnea and panting ranged between 100 and 250 per min. The rectal temperature at which the effect was present ranged from 37.5° to 40.8°C. and in 10 of the cases was between 38.0° and 38.5°C.

After a period of time ranging from 20 minutes to an hour (in 10 of the cases between 20 and 35 min.) the panting had stopped and respiration had become stabilized at a lower rate, ranging from 24 to 112 per min. The rectal temperature at this time ranged from 36.9° to 37.9°C. and in 10 of the cases was between 37.3° and 37.8°C.

The occurrence, during recovery from ether anesthesia, of pant-

¹ Magoun, H. W., Harrison, F., Brobeck, J. R., and Ranson, S. W., research in progress.

ing in 2 cats with negligible damage to the brain necessarily raises the question as to what part the anesthetic may play in the development of decorticate panting.^{2, 3}

We are unable to offer a satisfactory explanation of the effects of ether and urethane upon the panting mechanism. It is possible that they may produce a release from inhibition or they may cause a chemical excitation. Whatever the nature of their action, it is important to bear this action in mind whenever these anesthetics are used in experiments on thermal or decorticate panting.

9707

Post-Rotatory Nystagmus Following Decerebration in Guinea Pigs with Unilateral Cerebellar Lesions.

A. R. BUCHANAN. (Introduced by S. W. Ranson.)

From the Institute of Neurology, Northwestern University Medical School.

Bauer and Leidler¹ reported that they could elicit nystagmus after removal of all parts of the cerebrum as far down as the corpora quadrigemina. Wilson and Pike² could not confirm the results of these workers. They found that, as a general rule, complete removal of the cerebral hemisphere on the side of the slow deviation abolished all except a small rotatory component of the quick phase of nystagmus, while complete removal of the cerebral hemisphere of the side toward which the quick component is directed has but little effect on the quick movement.

Ivy³ performed a series of cerebral ablations in frogs, turtles, pigeons, rabbits, kittens, cats, pups, and dogs. He found, in most of these animals, that complete decerebration did not abolish the quick component of the post-rotatory nystagmus and that there was an actual increase in the nystagmus in most cases. He considered the conclusion warranted, on the basis of his findings, that the quick component of eye nystagmus is not due to the integrity of a cerebral reflex arc, as was held by Wilson and Pike, but is a lower

² Bard, P., *Am. J. Physiol.*, 1928, **84**, 490.

³ Lillenthal, J. L., Jr., and Otenasek, F. J., *Bull. Johns Hopkins Hosp.*, 1937, **61**, 101.

¹ Bauer, J., and Leidler, R., *Monatsschr. f. Ohrenh.*, 1911, **45**, 937.

² Wilson, J. G., and Pike, F. H., *Arch. Int. Med.*, 1915, **15**, 31.

³ Ivy, A. C., *J. Comp. Neurol.*, 1919, **31**, 1.