The stomach wounds all healed *per primam.* In each group the averages of the breaking strength and the standard deviation for every postoperative interval were computed. Fisher's[9] formula for small samples was applied to determine whether the differences in the means of the two groups were statistically significant.

Results. The local application of sulfanilamide crystals in the edges and in the immediate vicinity of stomach wounds in rats did not affect the healing of these wounds. (Fig. 1.) Histological studies of the wounds in the experimental group revealed the rare presence of the sulfanilamide crystals. These were engulfed within multinucleated giant cells which were located only in the serous and submucous coats at the margins of the wound, but not in the zone of actively proliferating fibroblasts. Except for this mild foreign body reaction the microscopic picture was essentially the same as that in the control group.

13086 P

Functional Localization Within the Anterior Cerebellum.

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The anterior cerebellar lobe is that portion of the corpus cerebelli lying anterior to the primary fissure. It includes 3 major subdivisions, the culmen, centralis and lingula; the first 2 of these areas possess definite hemispheral expansions. In a previous communication[1] a short description was given of the postural deviations which follow removal of the entire anterior cerebellar lobe. The present report deals with the results of further studies in the dog, cat and monkey, designed to investigate the problem of localization of function within this region.

The ablations were made from above through the tentorium. The series included 53 dogs, 18 cats and 23 monkeys. The animals were observed postoperatively for periods ranging from 5 days to 1½ years, were sacrificed under anesthesia, the brains removed and studied grossly. Detailed histological studies were obtained in 42 animals; appropriate serial sections of the brain stem and cerebel-

[9] Fisher, R. A., *Statistical Methods for Research Workers,* Edinburgh, 1934.

[1] Fulton, J. F., and Connor, G. J., *Trans. Am. Neurol. Soc.,* 1939, 53.

lum in each were stained by either the Spielmeyer, Kulschitsky, Nissl or hemotoxylin and eosin method. The results may be summarized as follows:

I. *The spinal (paleocerebellar) anterior lobe.*

(1) *Ablation of the culmen* alone provokes a complex of signs entirely similar in direction to those already described in the total anterior decerebellate preparation, but, strikingly, they are limited to the hindlegs, each of which is equally involved. The forelegs and the neck are unaffected. The syndrome of this region is characterized by a profound release of the antigravity muscles in the hindlegs, of such a nature that these muscles respond hyperactively to all extensor postural influences. The local static reflexes are conspicuously increased; thus, the positive supporting reaction (Stütz response) is strongly hyperactive and well-defined lengthening and shortening reactions are present. The segmental static responses are similarly released; the reflexes of stance, the Schunkel, Hinkebein and Stemmbein reactions are increased to such a degree that, in the hindlegs, the gait is crooked and weaving, the extremities exhibit marked errors in range, rate, force and direction and are placed inefficiently for smooth balance. Moreover, the strength of these postural responses is distinctly modified by general static influences; thus, the neck tonic and labyrinthine tonic influences result in a further increase or decrease, appropriately, in each of these reactions. The deep tendon reflexes of the involved hindlegs are likewise hyperactive and spreading and can be modified by changes in the animal's position in space. This extensor release is significantly less in degree than that observed after total anterior decerebellation, for reasons which will be noted.

Further restriction of the ablation to one lateral expansion of the culmen results in entirely similar signs but with their further *limitation to the ipsilateral hindleg alone.* There thus appears a complex of signs restricted solely to a *single extremity.*

(2) *The posterior centralis,* which possesses a definite hemispheral expansion, controls, similarly, the forelegs alone. Extirpation restricted to this region is followed by the signs already noted but they are now limited to both forelegs, each of which is equally involved. Further restriction of this ablation to one hemispheral expansion in this region provokes the same signs but, again, these are limited to a *single* extremity, the ipsilateral foreleg.

(3) *The anterior centralis,* a predominantly midline structure, presides in like manner over the neck extensors. The signs are limited to the neck and are somewhat more subtle than those already

noted. There appears an increased extensor postural sensitivity in the neck muscles but a conspicuous opisthotonos fails to appear unless the "released" neck muscles are further reflexly stimulated (see below).

II. *The vestibular (lingula) anterior lobe.* (4) Following pure lesions of the lingula the signs are such as to suggest "release" of the labyrinthine tonic influences. Though disequilibration is profound, local and segmental postural reflexes in the extremities are entirely normal provided support is afforded the animal's head. The labyrinthine tonic effects upon the extremities are, however, abnormally increased. The syndrome fails to appear after preliminary labyrinthectomy.

(5) Results of combinations of these discrete ablations indicate that opisthotonos appears only when the neck extensors are released and, in addition, a tonic influence upon them is also increased above normal. Thus, the prime requisite is that the anterior centralis be removed; then, either the labyrinthine tonic influences must be released by lingular ablation (resulting, compositely, in an extreme opisthotonos), or the foreleg extensor influence upon the neck be released by posterior centralis removal (resulting, compositely, in a mild opisthotonos).

Summary. Ablation studies in the dog, cat and monkey reveal a functional type of localization within the anterior cerebellar lobe. This localization is so precise that functional units in single extremities, the neck and the labyrinths are discretely represented in isolated anterior cerebellar subdivisions.

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Developmental Rate of Hybrids between *Rana pipiens* and *Rana sphenocephala.*

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This forms the second report on developmental rate in hybrid frogs. The purpose of these experiments, in hybridizing species that differ in rate of development, is to determine the earliest effect of the sperm on this particular character. Previously such a study has been made on hybrids between *Rana pipiens* and *Rana palustris.*[1]

[1] Moore, *J. Exp. Zool.*, 1941, **86**, 405.