

of milk is not increased by increasing the glucose content of the arterial blood. Milks following the perfusion experiments have increased lactose contents that must be explained on some other basis than the effect of increased glucose content of the blood.

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Limits of the Optically Active Cortex of the Rabbit.*

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The approximate coincidence of the optically excitable area with the area striata as defined histologically may be inferred from the work of Kornmuller¹ on the Berger rhythm, and of Bartley and Bishop² on responses to stimulation of the optic nerve. We have here examined the limits of optic cortex histologically and physiologically in the same animals. The physiological technique has been described (Bartley and Bishop²).

Ten animals were used. In 5 the indifferent electrode was fastened to bone adjoining the exposed cortex; in 5, it was plunged through the cortex to the subjacent white matter. In the animals of both series the local recording electrode was moved across the margins of the optic area, recording consecutively from series of points. Identifying stabs served to locate recorded points in 20 micron frontal sections cut serially from the cortex studied. The serial sections from each brain were used to reconstruct the histological boundaries of the area striata at 10 diameters (Fig. 1A). Upon these reconstructions were entered the physiological data.

The *lateral* border of the area striata, determined by the histological criteria of Rose,³ coincided closely with the functionally defined limit of the optically active area. In our histological preparations a transition zone of 1 to 2 mm. width occurred between the area striata and the neighboring area occipetalis which we could not assign exclusively to either field. The stabs which identified recorded

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¹ Kornmuller, A. E., *Biol. Rev.*, 1935, **10**, 383.

² Bartley, S. H., and Bishop, G. H., *Am. J. Physiol.*, 1935, **10**, 149.

³ Rose, M., *J. Psych. u. Neur.*, 1931, **43**, 353.

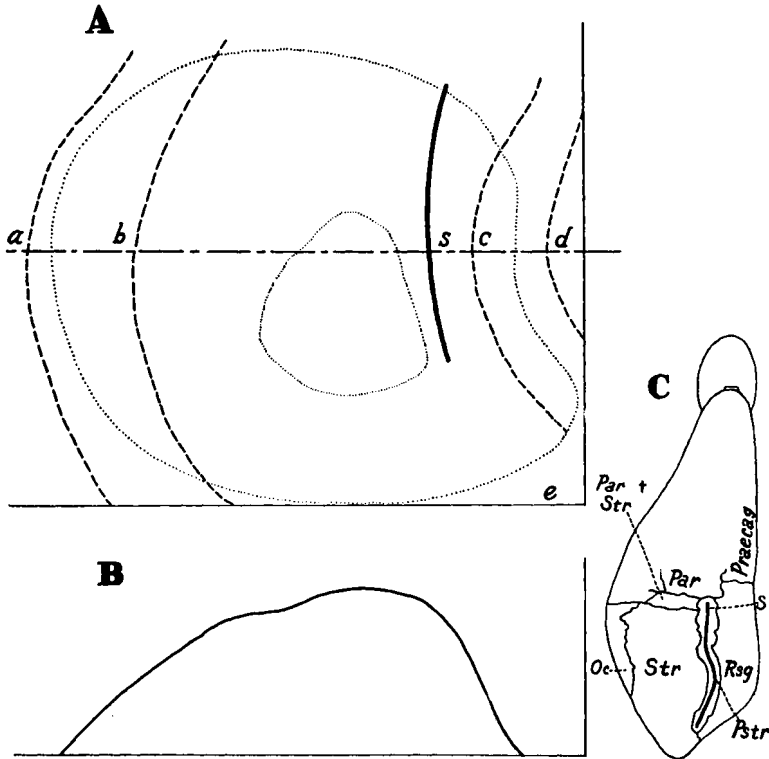


FIG. 1.

A. Map of the histological and functional boundaries considered significant in the interpretation of these data. Broken lines *a* and *b* indicate the limits of the transition zone between the occipetal and striate areas, broken lines *c* and *d* of the transition zone between the parastriate and retrosplenial areas. *S*, heavy line, gives the position and extent of the parasagittal fissure. Line *e* passes through the posterior pole of the cortex; line *m*, perpendicular to *e*, is the midline. Outer dotted line shows the limit of the optically excitable area, *i. e.*, the locus of points at which a single electric shock applied to the contralateral optic nerve induces a just visible response. Inner dotted circle indicates the region of the optically active cortex where the response is highest.

B. Profile illustrating the gradient in amplitude of potential response along the line *a-d* across the optically active cortex. This figure represents the average results of all experiments.

C. Diagram of the dorsal surface of the left cerebral hemisphere of the rabbit modified from Rose's corresponding map of the right cerebral hemisphere. The original Rose diagram has been simplified to suit the present purpose. *Str*, area striata; *Par + Str*, transition field between the areas striata and parietalis; *Oc*, area occipetalis; *Pstr*, parastriate area; *Rsg*, retrosplenial area. Heavy black line, *S*, has been inserted to indicate the extent of the parasagittal fissure referred to in the text. It corresponds to the *S* of 1 A.

points of minimal response on the lateral margin fell within the histological transition zone.

The *medial* border of the histologically defined area was significantly overlapped by the optically active area in each of the 10 ani-

mals used in the experiments. Records taken from serial points on frontal planes between the anatomical center of the area striata and the midline (Fig. 1B) demonstrated that the medial margin of the optically active area fell within the transition zone, about 2 mm. wide, between the areas parastriata and retrosplenialis (Figs. 1A and 1C). The area parastriata in the rabbit, which underlies a shallow parasagittal fissure, is, therefore, a part of the optic projection area; and from this and other evidence we conclude that it represents no more than a fissural adaptation of the histological pattern of the area striata.

The *anterior* histological border coincides approximately with the limit of the optically active cortex in this direction.

The *posterior* margin determined histologically or physiologically falls at the posterior pole of the hemisphere. Due to the rapid curving of the cortex at this point and the consequent disarrangement of the layer pattern in frontal sections, the correlation of histological and electrophysiological data was less reliable than on the other borders.

With the complication noted at the medial border, the coincidence between the previously defined architectonic area striata and the field of optically induced cortical response is satisfactory. This appears to justify utilizing the electro-physiological method in defining the boundaries of other projection areas from which induced responses can be recorded following stimulation of the appropriate sensory nerves.

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Co-Carboxylase (Vitamin B₁-Pyrophosphate) Content of Plants.

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Lohmann and Schuster^{1, 2} have shown that co-carboxylase is identical with the pyrophosphoric ester of vitamin B₁. I have demonstrated recently^{3, 4} that synthetic vitamin B₁ is readily phosphorylated by the duodenal mucosa and by extensively washed dry yeast

¹ Lohmann, K., and Schuster, P., *Naturwiss*, 1937, **25**, 26.

² Lohmann, K., *Angew. Chem.*, 1937, **50**, 221.

³ Tauber, H., *Science*, 1937, **86**, 180.

⁴ Tauber, H., *Enzymologia*, in press.