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 B_1-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 B_1. I have demonstrated recently[3, 4] that synthetic vitamin B_1 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.

which had been freed of co-carboxylase. The enzymic synthesis of vitamin B_1-pyrophosphate occurs best at a slightly acid pH. Euler and Vestin,[5] and Kinnersley and Peters[6] independently and at the same time when I published my experiments have also shown that yeast converts vitamin B_1 to co-carboxylase.

The enzyme carboxylase has an important part in carbohydrate metabolism. It is widely distributed in nature and it is accompanied by its co-enzyme. It occurred to me that a quantitative study of a series of plants for co-carboxylase and comparing these findings with the vitamin B_1 content of the plant material may be of interest.

The well ground plant tissues were extracted by boiling for 5 minutes with 3 to 5 times their weight of pH 6.239 phosphate (Sörensen). In 2 cc. of the clear filtrates co-carboxylase was determined according to Lohmann and Schuster.[1] In Column 1 of Table I, figures obtained for co-carboxylase are shown and in Column 2, figures for vitamin B_1 content of these plant materials as obtained by biological assay are given. By comparing these figures with that which I have obtained for the enzymatically synthesized co-carboxylase (not completely phosphorylated) it may be seen that only a

TABLE I.
Analysis of Co-carboxylase per gm. of Plant Material.

	Cmm. CO_2	Gamma of vitamin B_1*
Aspergillus Niger, mycelium pressed free of water	65	—
Cabbage, bleached	80	125-130
Onions	120	50-200
Orange, juice	80	150
" peel	125	—
" seeds	250	—
Pecans	170	300
Pepper, green	86	25-50
Spinach	10	125-250
Squash, summer, soft, seeds and all	107	875
Turnip, greens	93	125
Yeast, dry, bakers'	1600	650-2250
Co-carboxylase, enzymatically synthesized, equivalent to 5 gamma vitamin B_1	56	5

The Warburg-Barcroft apparatus was employed. Temperature 35°. Time 60 minutes. Volume of Warburg vessels 16 cc. In side arms 0.5 cc. of pyruvate solution (containing 5 mg. of pyruvic acid and 0.1 mg. of magnesium as $MgCl_2$) of pH 6.2. In the main room of the vessels 2 cc. of plant extract and 1 cc. of dry washed yeast.[4] The extensively washed dry yeast employed as carboxylase was practically free of co-carboxylase.[4]

[5] Euler, H. v., and Vestin, V., *Naturwiss*, 1937, **25**, 416.

[6] Kinnersley, H. W., and Peters, R. A., *J. Chem. Ind.*, 1937, **56**, 447.

* From Hawk and Bergeim.[7]

[7] Hawk, P. B., and Bergeim, O., *Practical Physiological Chemistry*, 11th edition, Philadelphia, 1937, p. 837.

small part of the total vitamin B_1 is present in these plants in the form of its pyrophosphoric ester. It should be noted, however, that there is no direct proportionality between CO_2 formation and the amount of co-carboxylase added, especially when too large amounts of the co-enzyme are to be estimated. For this reason in the case of dry yeast only 0.3 cc. of boiled yeast juice equivalent to 50 mg. of dry yeast was employed for the test. The results show that phosphorylation of vitamin B_1 by the mammalian organism is of vital importance as this co-enzyme plays an important rôle in the decarboxylation and dehydrogenation of pyruvic acid.[8] Furthermore animal tissues contain all of the vitamin B_1 as the pyrophosphoric ester.[8]

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Alleged Convulsant Properties of Brain Extracts.*

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Kroll[1] made the claim that convulsions could be produced in normal animals by the intravenous injection of extracts of brains removed from convulsing animals. Brain extracts from normal animals were said to be without convulsant properties. Both cats and rabbits were used but the former were regarded as more satisfactory. The minced brains were extracted 3 times with acetone and the remaining residue suspended in saline, extracted and filtered. This saline extract was employed in the experiments, the acetone extract being discarded.

Holmes[2] repeated these experiments on rabbits but used the acetone fraction of the extract. The acetone was evaporated and the remaining residue suspended in saline for administration. Such extracts were found to have marked constitutional effects when injected into animals. Death frequently occurred either with or without preceding convulsions. Extracts of normal brain as well as those from the brains of convulsing animals sometimes produced convulsions and both were equally lethal.

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[8] Lipmann, F., *Enzymologia*, 1937, **4**, 65.

* We thank Miss Doris Brophy for her assistance with these experiments.

[1] Kroll, F. W., *Z. f. d. ges. Neur. u. Psych.*, 1932-33, **143**, 780.

[2] Holmes, E., *J. Physiol.*, 1935, **85**, 400.