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The motor cortex and pyramid tract in the raccoon (Procyon lotor Linn.).

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The raccoon is a very intelligent animal and, as one would expect, relatively to the size of its body, it possesses a large brain with a highly convoluted cerebral cortex. Little appears to be known, however, about its cortical topography or the fiber tracts of its central nervous system.

The present note refers to the experimental localization of the motor areas and the subsequent tracing of the pyramid tract by the method of ablation and secondary degeneration. Five full-grown specimens were obtained. The cerebral cortex was exposed on the left side, under ether anesthesia, the motor areas were localized both by the bipolar and unipolar methods and then removed. The wound was closed and the animal allowed to live for about two weeks when the left hemisphere was exposed and explored in the same way before the animal was finally dispatched by an overdose of ether. The brain and spinal cord were removed and treated by the Marchi method.

The region from which muscular responses were obtained is relatively large and well defined. It occupies the whole free surface of what may be termed the post-cruciate convolution, extending from the mesial border of the hemisphere to a little way beyond the lateral extremity of the cruciate sulcus. Unless when the current was comparatively strong, no movements were obtained from the cortex in front of the cruciate sulcus. From the mesial border lateralwards the order of the responsive areas was as follows: anus, tail, hind limb and digits, body, fore-limb and digits, head and eyes, and face, mouth and tongue, the last curving forwards around the lateral extremity of the sulcus. The movements were readily elicited and the areas well defined but there was always some overlapping at the margins. The forearm area appeared to be the most easily excited, that is to say, it

responded to a weaker current than was necessary for the stimulation of the other areas.

The pyramid tract fibers were traced from their origin in the cerebral cortex, caudalwards, to the spinal cord. They occupied the usual positions in the crusta, pontine bundles and anterior pyramid above the decussation. In the posterior part of the medulla oblongata most of them crossed the median raphe and turned caudalwards into the lateral column of the spinal cord, but in three of the specimens examined a considerable number of fibers remained uncrossed and formed a direct ventral pyramid tract, extending along the margin of the ventral median fissure. This tract could be traced to the middle of the thoracic region where it disappeared. A few uncrossed fibers were also found in the lateral column.

It is generally believed that this uncrossed ventral tract (direct pyramidal tract) is limited to man and the anthropoid apes; such, however, is not the case, for it is present in the raccoon and is more pronounced still in the porcupine.[1]

The crossed lateral pyramid tract could be followed to the last of the sacral segments. In the raccoon this is a large tract both in relative area, in transverse sections of the spinal cord, and in the number of fibers which it contains. In no animal below the macaque monkey have I found it so extensive.

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Note on the action of tonsillar extract.

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We used the dried powdered tonsil of the calf. When a filtered infusion of two grains of the powdered tonsil was injected into the cat by the jugular vein in divided doses, it produced a great fall of blood-pressure, lasting about a minute, followed by a rise above normal, with a much slower and stronger heart beat. Increase of this dose suddenly arrested the heart. In the same animal it was also a diuretic, increasing the flow of urine twenty times the original amount.

[1] Sutherland Simpson, PROC. SOC. EXPER. BIOL. AND MED., 1912, Oct. 18, p. 15.