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The importance of calcium in relation to growth.

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In certain cases of retarded development there is faulty skeletal development and disturbed calcium metabolism. The bones are frail and easily fractured; large quantities of calcium are lost through the feces, and the urine is almost free from calcium. It seems probable that the retarded skeletal development is due to the lack of calcium salts available for bone growth. Other cases of retarded development show no such disturbances of calcium metabolism and the bones are of normal solidity. In these cases there is a more fundamental absence of the "tendency to grow" rather than any lack of material for growth.

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The pyramid tract in the Canadian porcupine (*Erethizon dorsatus* Linn.).

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The nerve fibers of the pyramid tract pass caudalwards from their cells of origin in the motor area of the cerebral cortex and are homo-lateral until the lower part of the medulla oblongata is reached. At this level, in the majority of mammals that have been examined, most of the fibers decussate and take up a position in the lateral column of the spinal cord on the opposite side, just ventral to the posterior horn, forming the crossed lateral pyramid tract. A few fibers remain uncrossed and are found in the lateral column on the same side, constituting the direct lateral pyramid tract.

In man and the anthropoid apes a second uncrossed tract is found in the ventral column—the direct ventral pyramid tract. In mammals lower in the scale than the anthropoids, it is generally held that this direct ventral tract is not represented at all.

This disposition of the pyramid tract fibers is not found in all mammals however. In the guinea-pig (v. Bechterew, Reveley), mouse (v. Lenhossek), rat (Flechsig, King) and squirrel (Weigner), and in the monotremes and marsupials (Kölliker and Ziehen), the crossed fibers run in the dorsal and not in the lateral column of the cord.

In the spring of the present year, I obtained some full-grown porcupines with the object of investigating the course of the pyramid tract fibers in this animal. The left motor cortex was located by electrical stimulation and then extirpated in the usual way. At the end of about a fortnight after the operation in each case the animal was killed, the brain and cord removed, stained by the Marchi method and sectioned at all levels. A full description of the resulting degenerations will be published later; in this preliminary communication only the most important points will be mentioned.

In the internal capsule, pes pedunculi, pontine bundles and upper levels of the medulla oblongata, the fibers occupy the usual positions and no special comment is called for, but in the lower part of the medulla oblongata the arrangement is peculiar, and nothing similar, so far as I know, has been hitherto described in any other animal.

At the decussation of the pyramids most of the degenerated fibers cross the median raphe, pass backwards through the gray matter, and take up a position in the dorsal column of the opposite side occupying the ventral portions of the fasciculi of Goll and Burdach. A few of the crossed fibers curve outwards and enter the opposite lateral column of the cord. A very considerable number of fibers, however, remain uncrossed and are continued into the cord, forming a comparatively large and compact bundle in the ventral column extending along the margin of the anterior median fissure. Some uncrossed fibers are also found in the dorsal column of the same side but these are very scanty.

In this animal, then, the fibers of the anterior pyramid on entering the spinal cord are divided into four fasciculi, two crossed and two direct, viz: the crossed dorsal pyramid tract, the crossed lateral pyramid tract, the direct ventral pyramid tract, and the direct dorsal pyramid tract. Of these the crossed dorsal and

direct ventral tracts are much larger than the other two and can be traced as far as the lower sacral segments. The crossed lateral and direct dorsal seem to disappear in the upper thoracic region. Arranged according to the number of fibers which they contain, the order is crossed dorsal, direct ventral, crossed lateral, direct dorsal.

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Interpolated extra-systoles, of frequent occurrence, in an otherwise normal human heart.

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In the extensive literature upon extra-systoles about twenty writers have described the type known as the interpolated beat of the ventricle. Although such beats have frequently been produced experimentally, their occurrence clinically is comparatively rare.¹ Almost without exception they have been observed in cases showing gross lesions of the heart. The present case is of interest because the interpolated contractions occur persistently and frequently in a heart which, aside from a slow sinus rhythm, is otherwise normal. It furnishes a striking example of an organ on the borderland between a physiological and a strictly pathological condition.

T., a Chinese student at Cornell University, is in good health. He is able to take vigorous exercise, such as running, tennis, etc. About two years ago a cardiac irregularity was discovered in his routine physical examination. Prior to that time he was wholly ignorant of any disturbance in his heart, and is at no time conscious of the heart's contractions. Polygraphic records have frequently been made during the past two years and the organ has been found beating normally on two occasions only, and but for a short time.

The tracings show extra-systoles of the ventricle which occur with considerable regularity on some days, but usually they appear at varying intervals. The normal rate of the dominant rhythm

¹ Mackenzie, Lewis, Wenckebach, and others.