muscle hypertonus in parkinsonism and some types of cerebral palsy. In these case disorder of the reciprocal movement of the extremities is often seen, and by the stereotaxic pallidotomy, it is, in many cases, much improved together with reduction of the muscle hypertonus.

Animal experiments show that the spontaneously occurred reciprocal movement of the fore-limb of cat (lower thoracic spinal section is added to higher level of decerebration) becomes non-reciprocal during and shortly after the pinna pinch because of temporary elevation of the muscle tonus. In such preparations, the reciprocal movement of the fore-limb is also induced by regularly intermittent repetitive stimulation of the red nucleus. Appearance of artificially induced reciprocal movement depends on the level of muscle tonus. Thus, if the muscle tonus is altered continuously from low to high level, or vice versa, the reciprocal pattern is seen only in moderate tonus level and otherwise non-reciprocal.

We are interested in such parallelism between muscle tonus and patterns of movement, and shall refer to the further details of its central mechanism.

19. Analysis of Effects of Pyramid Stimulation upon Spinal Motor Reflexes and Gamma System

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In order to investigate the function of the pyramidal tract, effects of pyramid stimulation upon flexor and extensor monosynaptic and polysynaptic reflexes and upon firing indexes of flexor and extensor motoneurons were analysed, by stimulating the peroneal or tibial nerve. Effects of pyramid stimulation upon gamma system, galvanic skin response and blood pressure were also observed.

In this experiment, special attention was taken in order to eliminate all the possible indirect effects of pyramid stimulation upon above noted phenomena due to current spread, through collaterals of the pyramidal fibres to the brain stem structures and through gamma system in the periphery.

Results:—Facilitatory effects of pyramid stimulation upon flexor motoneurons were recognized, whereas distinct inhibitory effects were observed upon extensor motoneurons, although an initial facilitatory effect was obtained in some of extensor motoneurons following single pulse stimulation to the pyramid. On some gamma neurons, both facilitatory and inhibitory effects were observed. It was suggested that the pyramidal tract, as a whole, has a stronger facilitatory effect upon flexor

motoneurons and that facilitatory fibres to the flexor motoneurons may exert reciprocal inhibitory effect upon extensor motoneurons.

Neither galvanic skin response nor change in blood pressure by pyramid stimulation was elicited in this present experiment.

20. An Experimental Neuropathological Study of the Effects of High-Frequency Focused Ultrasound on the Brain of Animals

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Well localized lesions were produced in the brain of cats and rabbits by means of high intensity focused ultrasound. Animals were allowed to survive for varying periods, from 3 hours to 78 days following irradiation. The focused ultrasound was generated by concave titanite acid barium transducer. Frequency, 1.1 MC, focal length, 7 cm, diameter of generator, 6 cm and peak intensity was 1551 w/cm². The large ultrasound lesions were characterized by a double zonation, but small lesions showed no zonation. 3 hours after irradiation the pathologic changes in the ultrasound lesions were loosening of tissue, pale and fragmented myelin sheets and pyknosis of nucleus of glia. The borderline of lesion was well defined. The inflammatory changes were pronounced 3 days after irradiation. The numerous macrophages came together at peripheral portion of lesions, and they entered into the lesions. 3 weeks after irradiation the lesions were occupied by macrophages, fibrocytes and lymphocytes. At this stage macrophages were swollen and contained small fragments of myelin in them. Astrocytes showed necrobiosis and proliferation of fibrous tissues and blood vessels were seen. 78 days after irradiation the lesions were surrounded by connective tissue and they were well localized. But the most part of the lesion was occupied by regularly arranged macrophages and scar did not yet developed. There was no marked change in size of lesions during the period of 3 hours to 78 days, there were never any late changes comparable to those following X-radiation. There was no change along the pathway of the ultrasound beam. Blood brain barrier was also destructed in the lesions and its reconstruction was completed after about 1 month.