

EDUCATION IN THE THERAPEUTICS OF GRAY MATTER

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The gray matter is anatomically disposed as the cortex of the brain, as several islands within the same and as the medulla of the brain stem and of the spinal cord.

Histologically it is composed of many-poled cells and branched dendritic processes, (arborizations) together with its supporting tissue. Functionally it is the seat of so-called "centers" related both to trophism and to action, mental, special sense and motor.

Lesions of gray matter may be discrete, general, or complicated by those of white matter or of other tissues or organs.

Discrete lesions and their therapy are the subject of discussion in this paper. The discussion is further narrowed to the motor gray matter. Motor gray matter is related in location to trophic substance and is probably related to it in function.

The location of motor gray matter is each side of the fissures of Rolando for a variable area, beneath the ventricle of the medulla oblongata, and in the interior horns of the spinal cord.

The function of motor gray matter is receiving and passing of impulses to the motor tracts of brain and cord and to the peripheral nerves.

Lesions of this substance are treated on the basis of four principles, the specific, the hygienic, the trophic-instinctive and the educational.

If the lesion be specific within the range of known specific remedies, specific treatment is fundamental.

The hygienic treatment has the same importance as in pathologic conditions of other tissues and organs.

The trophic-instinctive belongs to the relatively unconscious and involuntary activities by which all repair is made and the fundamental functions are achieved.

The educational principle has a preponderating application in lesions of motor gray matter when those lesions are end results or residui of pathologic or traumatic processes.

These residui are the most frequent lesions of gray matter.

They group themselves into the cerebral palsies and the spinal palsies. Typical of the former is birth palsy. Here hemorrhage or inflammatory changes have occurred affecting the Rolandic areas with consequent atrophy of gray cells. The functional effects of such lesions are seen in spastic paralyses of skeletal muscles of greater or less extent.

Typical of spinal palsies is anterior polyomyelitis. Here there is toxic atrophy of gray cells in the anterior horns. Functional effects are seen in flaccid paralyses of skeletal muscles.

What recovery can be hoped and how can it be effected?

The usual points of attack are the muscles themselves, and their vascular and nerve supplies.

It is fondly hoped that atrophy can be limited by stimulating the muscles and nerves and mechanically inducing greater vascular activity. It is sometimes thought that by sending the electric current through the neuromuscular system function may be restored. But such effects have never been produced by these means, as the means are no more adapted to the ends sought than the stimulation of an electric light bulb and its contents is adapted to reactivating a damaged motor. Whatever results have been achieved are to be attributed to nature's unaided efforts as seen in hygienic and trophic-instinctive effects.

Gray matter responds directly only to educational efforts. Educational results are characterized by more complex and finely adaptive arrangements and contacts between gray cells through their arborizations. It is in the unhurt but hitherto unused surplus of gray cells that our hope lies.

New paths for the transfer of motor impulses possibly may be found, and new arrangements in cell groups when partial damage has been done may be achieved.

Even though a current of electricity may travel the route of the reflex arc there is only cellular response and not definite and purposeful organic function. Tetany and tremor are not artistic achievement. Causing the muscles to "jump" is not dancing a jig.

Persons with cerebral and spinal lesions of motor gray matter are improved by definite neuromuscular re-education. If massage and electricity and the like have value it is because of general hygienic effects.

In children re-education is carried on by reconstructive play often beyond the limits of that obtained by direct muscle pedagogy. Competitive reconstructive play often carries function to a complete recovery.

Nothing can be manipulated into gray motor matter except the damage of fatigue. Much may be developed out of motor gray matter in proportion to the unhurt residue and skill of the pedagogue.

DISCUSSION ON DR. EAST'S PAPER

Dr. Pollock said, "I had in the last ten days an experience which illustrated nicely Dr. East's reference to involvement of the Rolandic area during child birth. This was a tedious and difficult labor—culminating by forceps. This child's face on one side was involved—spastic contractions of hand and arm which had almost cleared up in ten days, showing the tendency to recover by being left to nature."