MINIATURE EXERCISE MACHINE FOR
INFANTILE PARALYSIS *MAX STRUNSKY, M.D.
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In treating chronic infantile paralysis by massage, electricity and passive motion of the paretic muscles we must not forget that the seat of the disease is not in the muscles, but in the anterior, gray cornu of the spinal cord, and that atrophy and degeneration in this disease are not limited to the muscles alone, but involve all the structures that enter into the muscular contraction, chiefly, the spinal nerves, the motor cells in the spinal cord, the conducting tracts, the motor brain centers dominating the affected muscles, as well as the weakening of the will power to concentrate on these muscles.

Function is the antagonist of atrophy and degeneration. Massage, electricity and passive motion exercise the muscles, but they do not exercise the other structures involved in the voluntary muscular contraction, and the effect of such exercise—whatever it may be—is limited to the muscles. Permanent benefit to the paralytic muscles is produced only by voluntary exercise because in such exercise the structures involved are simultaneously and cooperatively functioned. The effect of voluntary muscular contraction is to exercise the will power and the atrophic motor brain centers and, by reciprocal action, to develop the motor cells in the spinal cord and the strength of the muscles.

That the spinal motor power can be developed is proved by the improvement that takes place in infantile paralysis often years after the original attack, and by the increased strength in the paralytic limb after scientific and persistent treatment, and by the fact that a great many children, especially those that are mildly affected, gradually outgrow their trouble.

Improvement in chronic infantile paralysis cannot be accounted for by the regeneration of the destroyed motor cells in the spinal cord. The pathologic law that dead organic cells never regenerate is fixed. Improvement can be explained only by the development of the motor gray matter in the spinal cord based on the physiologic law that cells increase in size and strength with function. This is accomplished by the use of the

Miniature Zander machine for exercising limb in infantile paralysis. May be attached to a table or chair.

paralytic limb, by muscle education, whereby the child develops his mental power to force the contraction of the paretic muscles, and by the natural growth and evolution of the cerebrospinal system during childhood.

Voluntary exercise of the paretic muscles, the most important element in the treatment of chronic infantile paralysis, is, unfortunately, monotonous and the child's feeble attention soon wanders from its work. The machine illustrated gives the child something to do, with the result that more voluntary muscular contractions are accomplished. The machine is also labor-saving, inasmuch as it assists and resists the movements of the paralytic limbs automatically and takes away this strain from the person supervising the physical culture.

The instrument shown in the illustration is a miniature Zander machine. It is small, portable, cheap, and can be attached to a table or chair. The child sits on the table or chair to which the machine is attached and the paralyzed limb swings the handle. The resistance to the movement is regulated by the length of the pendulum and the "assistance" by the angle of the handle.

Resistance to the movements must be gradually increased. This cannot be done with the hand, because it is hard to remember the exact force exerted at the previous treatment. By regulating the length of the pendulum the resistant force is controlled to a fraction. The gradually increased length in the pendulum is also the record which tells of the amount of improvement that has taken place in the paralytic limb in a given time.

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THE TRANSPLANTATION OF BONE FOR
CORRECTION OF DEPRESSED
DEFORMITIES OF
THE NOSE

REPORT OF CASES *

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It is not my purpose in this paper to discuss the fundamental principles of bone transplantation in the human body, nor do I intend to review in detail the work of the various experimenters in this field of surgery. Suffice it to say that nearly all that has been written on this subject has had to do with supplying defects in the various bones of the body, chiefly those of the head and the long bones, while little has been said about the introduction of bone into the soft tissues, where the conditions for its nourishment and growth must differ widely from those where the graft is used to supply a deficiency in the continuity of another bone.

It is generally admitted (1) that the autoplasmic operation, i. e., the transference of bone from one part of the body to another gives the quickest and best results; (2) that homoplastic transplantation, i. e., from one animal to another of the same species, is usually successful; (3) that heteroplastic transplantation, i. e., from one animal to another of a different species, is unsuccessful.

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