

PHYSIOLOGY

Nerve Process Protects

➤ A BUILT-IN safety valve that prevents our muscle tendons from being torn apart by work loads that are too heavy has been detected by a group of scientists in the University of California School of Medicine.

The finding may prove to be helpful to physical therapists in devising better treatments for strengthening muscles.

The scientists found the protective device while they were investigating an observation that muscles are not activated as much when in a stretched position as when shortened.

Seeking the cause of the effect, Drs. Benjamin Libet and Bertram Feinstein and E. W. Wright Jr., anesthetized the area where the tendon joins its muscle. The tendon is the band of tough tissue which connects the muscle to the structure it operates.

The scientists found that activation of the stretched muscle could be considerably increased by anesthesia of the tendon.

They decided that the tendon apparently has sensory organs which act as a safety

valve. When the muscle is under heavy stress—it is heaviest when stretched—the sensory organs apparently send danger signals back to the spinal cord, suppressing the nerve links that supply the muscle. Thus activation is stopped before a breaking strain can be put on the tendon.

But when the tendon is anesthetized, the warning signals apparently are blocked, and the muscle can be activated despite a heavy load.

Normally the built-in safety valve probably protects the tendon against damage. Ruptured tendons probably occur when muscular action is too fast for the suppressing signals to reach the spinal cord and cut off the activating impulses being relayed to the muscle.

Dr. Libet said the work suggests a way to improve muscular rehabilitation exercises. At present, muscle-building exercises usually begin by contracting from the stretched position. Some stretch is probably good for building up muscles. But inhibition when pulling on a load in a fully stretched position is such that there is probably less nerve link, or neurone, activation than if the muscle were partially shortened at the outset.

Science News Letter, September 10, 1955

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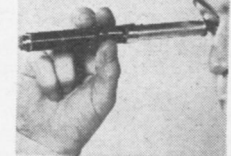
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