

maux, mais assez constant en le considérant relativement au poids du corps (croissance procentuelle relative).

Immédiatement après l'extirpation du thyroïde la croissance compensatoire du rein est peu considérable, le niveau du métabolisme diminuant beaucoup à cette époque là (amoindrissement du besoin de la fonction du rein) car si l'on attend 15 jours après l'extirpation du thyroïde avant d'écarter le premier rein, la croissance procentuelle relative redevient au moins normale. Le niveau normal peut être obtenu de même dans le sens absolu si l'on administre de l'hormone de croissance.

Immédiatement après l'hypophysectomie la croissance compensatoire du rein est encore peu importante ne pouvant non plus dans une épreuve courte être améliorée notablement par l'administration de l'hormone de croissance. Apparemment c'est encore la diminution du niveau du métabolisme (à cause du thyroïde atrophié) qui en est la cause, car 15 jours plus tard la croissance procentuelle relative redevient normale.

On peut donc conclure que l'hormone de la croissance et l'hormone thyroïde n'agissent pas directement sur la croissance compensatoire du rein mais seulement par la voie du poids du corps resp. du niveau du métabolisme (dans tous les deux cas „besoin”). Cette conclusion est aussi de vigueur pour la croissance „non compensatoire” du rein et aussi pour celle du coeur, comme parut d'un expérimént de comparaison des poids des corps et de ceux des organes chez des rats normaux, des rats hypophysectomisés et des rats hypophysectomisés traités avec de l'hormone de croissance.

**Comparative Physiology.** — POSTMA, N.: *Ueber den Tonus des Schneckenfusses (Helix Pomatia L.). V. Elektrische Reizung der Pedalnerven hemmt nur dynamischen Tonus.* — *Electric stimulation of the Nn. pedales only inhibits "young viscosity".* (Preliminary communication), p. 380.

In a previous paper (18) we communicated that a marked inhibition of the tonic resistance against extension of the foot muscle of the snail is only to be obtained, if the stimulation of the pedal nerves is started before the lengthening sets in. The application of a stimulation to the nerves when the extension is already in progress, causes but a slight decrease in resistance; this decreased effect of the inhibitory stimulation was ascribed to an increase of tonus produced by the extension. We now investigated the effect of such a stimulation of the pedal nerves in two cases in which the muscle is extended no more: *a.* If the foot is resting and we only verify its condition with the aid of a little stretching load, which is not capable to evoke elongation; *b.* Directly after extension, when the muscle is unloaded and reshortens partly (recovery) by the tension. arisen from the lengthening.

In the first case (fig. 3) every reaction of the muscle fails. Obviously there is only inhibitoreable resistance if the foot is lengthening; this form of tonus does not exist in the resting muscle. By the look of the behaviour during extension the muscle acts as a non-living body (cf. fig. 2 and 1), but the neuromuscular reaction (inhibitoreable by stimulating the pedal nerves) shows on the contrary, that the foot is not resting, but is acting as a living body. Thus the inhibitoreability is to be used as a test to distinguish the reaction of a physical system and the behaviour of an object behaving physiologically.

This principle was used to investigate the recovery of the muscle after unloading. Indeed the reshortening is partly to be inhibited (fig. 2): the elastic recovery is only delayed, during the elastic after effect the stimulation causes a sag of the curve, followed by a new shortening when the stimulation is interrupted. Apparently in the recovery there is a tonic contraction (inhibitoreable dynamic tonus) allied to the physically acting static tonus.

The inhibition shows a remarkable after effect: it suppresses the proper tonic reshortening, part of the recovery, as well as the dynamic tonus which has arisen by the extension and actively increases the tonus level.

Our conclusion is therefore: the lengthening diagrams as well as the recovery graphs correspond indeed to the BINGHAM-curve, but the tonic resistance is higher than the tonus of the non-loaded resting foot and the recovery exceeds the reshortening, caused by the elastic tension, which is provoked during lengthening.

Fig. 2. Deformation curves obtained from the foot of a snail after removal of the ganglia. Left side: the lengthening: normal consecutive extension curves 4, 5, 6 and 7. Right side: recovery. After elongation (time  $x_0$ ) the lever has been drawn up and the extending force removed. Recovery is measured by stretching the muscle and the thread between foot and recording lever with the aid of a load of 2 g, till the lever stops (point  $y_1$ ). Every 20 sec these stop-points are recorded on a moving kymograph and afterwards we draw a line through these points ( $y_1$ — $y_2$ — $y_3$  etc.) In this way we get the normal recovery curves 4, 5, and 6. After the 7th elongation a faradic stimulation of sufficient strength to produce an inhibitory influence is applied to the pedal nerves (every other min during a min). The elastic recovery is only delayed, the elastic after effect is decreasing after further stimulation (viz. arrow). The deformation curves 8 and 9 show after effects of the inhibition during the 7th recovery: the left part of the curves runs lower than the preceding one and the right part shows an extra loss of recovery (8 and 9, in stead of 8' and 9').

Fig. 3. Testing of inhibitory stimulation on the resting foot. Left half: stretching of thread and muscle with unstimulated nerves. Right side: the same with stimulation. No inhibition is effected: *without elongation there is no inhibitoreable tonus!*