the form of characteristic clumps resembling in the arrangement the complexes described here. It is possible that alterations in the fine structure of the *Triturus alpestris* liver mitochondria are caused by laboratory conditions (particularly pollution of water, especially since the liver of one individual was markedly enlarged. Recently, HALL and CRANE[16] reported the occurrence of electron-opaque rod-shaped structures inside the cristae of heavy mitochondria isolated from beef heart. These structures on sections running parallel to their length and perpendicular to the cristae, appeared as dense continous lines 45–60 Å thick and resembled electron-opaque elements in bodies classified here as type I complexes. The ascertainment whether the latter also form rods described by HALL and CRANE, or whether they have different properties, requires further studies, which are now in progress. The investigations are aimed at establishing the accurate structure of intramitochondrial complexes in hepatocytes of *Triturus alpestris*, as well as their function. Particularly interesting will be to find out whether the differences described in the organization of lamellar bodies concern the same structure in different stages of degeneration, or various stages of physiological adaptation to laboratory conditions; whether they represent sections of the same structure at different planes, or constitute three independent and morphologically distinct complexes.

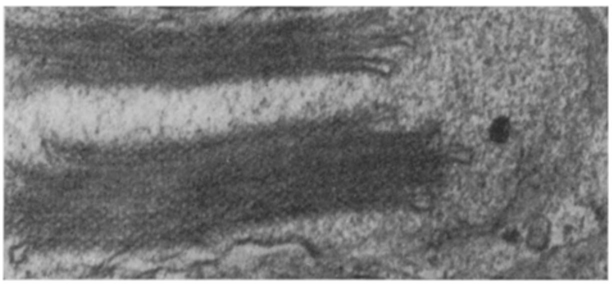

Fig. 5. Fragment of the mitochondrion with crystalline-like lamellar complex. ×138,750.

Résumé. Des structures lamellaires sont décrites dans la matrice mitochondriale du foie de triton (*Triturus alpestris*).

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Mechanical Recovery Properties of Human Tendons

The collagen fibers are an essential part of tendons, ligaments, bones, capsules of joints, vessels, skin and capsules of organs. They possess several typical mechanical properties. Among these the most important are tensile strength, elasticity, viscosity, relaxation and retardation.

The mechanical recovery function is also an essential physical property of tendons. It plays an important part for all anatomical structures which contain collagen fibers. We are especially engaged with this recovery function of tendons.

Material and methods. We have extirpated the tendon of the M. extensor hallucis longus from corpses, which were preserved in cold-storage-chambers, 36 h after death. Using a technical tensile-testing-machine (type 1381, manufactured by Zwick & Co., Einsingen bei Ulm, Western Germany) we have tested the tendons at a temperature of about 22°C. To fasten the tendon we used the grips type 8132, also produced by Zwick & Co., Einsingen. In order to prevent the tendon from gliding out of the grips, we put screen linen, produced by Black & Decker, Type 1235–88, between the jaws of the grips and the tendon. We chose a length between the grips of 50 mm. First we expanded the tendon with a strain rate of 2 mm/min to a preload of 8 kg in the 1st experiment (diagram Figure 1), to a preload of 32 kg in the 2nd (diagram Figure 2a) and in the 3rd experiment (diagram Figure 2b). As we wanted to compensate the relaxation we expanded the tendon several times up to this load. This is why a saw-tooth-curve is written. After about 3 min we took the preload away from the tendon with a rate of 2 mm/min in the first and second experiment (diagram Figure 1 and Figure 2a) and with a rate of 8 mm/min in the 3rd one (diagram Figure 2b), until we reached 25% of the starting-point load. Now we can observe an increase of tension in the tendon.

Results. A tendon, which has been extended and from which this load is partly taken away, shows an increase of its own tension when it is held at a constant length. This means: tendons have the property of mechanical recovery when the load is partly reduced. It is remarkable

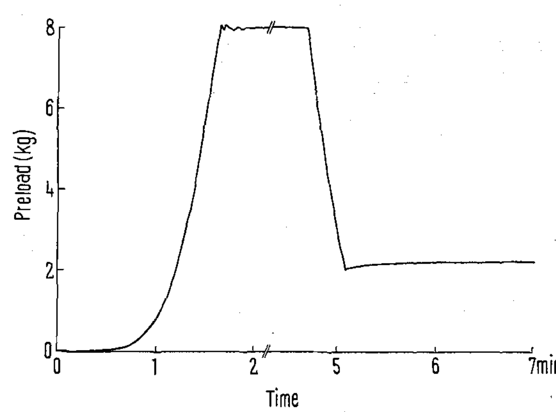

Fig. 1 (time recording). The tendon was expanded with a strain rate of 2 mm/min to a preload of 8 kg. To compensate the relaxation, it was then expanded several times up to this load. After about 3 min we took the tension away with a rate of 2 mm/min, until we reached 25% of the preload. Now the length was held constant and the increase of load was registered.

that this recovery function is expecially good at a load of about 25% to 30% of the preload.

Comparing diagram Figure 1 with diagram Figure 2, we noticed a much better recovery function in the second test. It is caused by the high preload of 32 kg. In both of these two tests we went down to the starting level for the recovery which was 25% of the preload, and in both cases the speed going down was 2 mm/min.

In the 3rd experiment, which is shown in diagram Figure 2b, we now went down with a rate of 8 mm/min, whereas the other conditions of the test were the same as in the 2nd test. Now the recovery function is better than in the 2nd test.

These examples are taken from a large series of experiments and can be regarded as representative. The experiments were performed on the large toe extensor tendon, which was extirpated from the right foot of a 70-year old woman.

Conclusion and discussion. The tests Nos. 1, 2 and 3 allow us to conclude: 1. The shape of the recovery function written after we allowed the tendon to relax to about 25% of the preload is better, the higher the preload was. 2. The faster the tension is lowered, the more significant is the form of the recovery function.

The mechanical recovery function of the collagen fibers, which represent a viscoelastic, biohighpolymer body, are regarded by us as an essential property of them. Because this property always occurs when the tension is partly reduced, the collagen fiber, though it is not endowed with the capacity for active contraction, is able to raise its load and hold it at a certain level. In this way the consequences of the permanent use are, apart from the biological restitution, also mechanically compensated.

We made a number of biomechanical tests on the tendon of the M. extensor hallucis longus, which mainly consists of collagen fibers. It shows the property of an increase of load after the tension has partly been taken away, although the length is held constant. The mechanical recovery function depends on the speedrate with which the tension is reduced, and on the other hand, it depends on the absolute quantity of the preload. The recovery function is an essential property of collagen fibers and is important in reference to tendons, ligaments, bones, vessels and peripheral nerves – nevertheless not much attention has been paid to it.

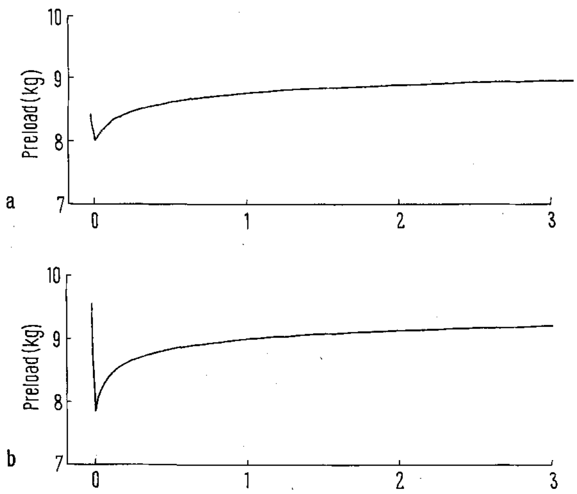

Fig. 2a (time recording). Here the preload reached 32 kg and we went down with a speed of 2 mm/min to the starting-point for the recovery. This starting-point – again 25% of the preload – was now located at about 8 kg.

Fig. 2b (time recording). The conditions were the same as in diagram Figure 2a, only the rate of oging down was now 8 mm/min.

Zusammenfassung. Es wird gezeigt, dass eine isolierte Sehne des M. extensor hallucis longus vom Menschen nach einer bestimmten Vorspannung, wenn diese auf $^1/_4$ reduziert wurde, bei gleichbleibender Länge eine Spannungszunahme aufweist.

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Effects of Lithium Chloride on Normal and Neoplastic Cells in vitro

The capacity of lithium ions to inhibit cell proliferation has been described for several cell types: fungi, bacteria, plants and mammals (for review see SCHOU[1]). Confirming these early works, DUBINI and BOLLOLI[2] observed recently the antimitotic action of LiCl on human leukocytes in vitro. Furthermore, GENEST and VILLENEUVE[3] reported a highly significant decrease of the mitotic index in manic-depressive patients treated with lithium. These data emphasize the need for a systematic re-evaluation of the antimitotic effect of lithium as this ion is now increasingly used as an effective drug in mania.

We report here preliminary results concerning the effects of increasing concentrations of LiCl ($1.10^{-7}M$–$1.10^{-1}M$) on the proliferation of normal Rhesus monkey kidney fibroblasts (RMK) and of neoplastic epidermoid KB cells cultivated in Eagle-Earle medium according to techniques described elsewhere[4]. The proliferation has been evaluated by enumeration of isolated cell nuclei and determination of mitotic index. The selective and differential fluorescence of both types of nucleic acids by acridine-orange has been used to investigate the possible action of LiCl on DNA and RNA. In order to control the eventual intervention of the anion (Cl-) and of the osmotic disturbance, the effects of LiCl were compared to those of equimolecular concentrations of NaCl ($1.10^{-7}M$–$1.10^{-1}M$) which were also additionally added to the medium. Complementary studies are in progress where the isotonic conditions are maintained by using original medium deficient in NaCl to which different mixing concentrations of NaCl and of LiCl are added to isotonicity.

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