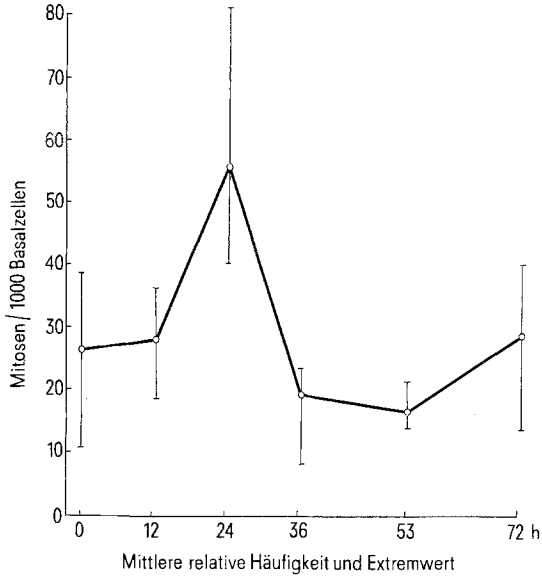
dem Ausgangswert – im Mittel 26,7. Nach 36 h beträgt die mittlere Häufigkeit der Mitosen 19,2 und unterschreitet somit deutlich den Ausgangswert. Nach 53 h erreicht die mittlere Häufigkeit der Mitosen ihren niedrigsten Wert von 16,5 Mitosen, um nach 72 h schliesslich den mittleren Ausgangswert wieder zu erreichen.

Das Verhalten der relativen Häufigkeiten in Abhängigkeit von der Zeit weist eine formale Ähnlichkeit mit dem Verhalten einer geregelten Grösse im Sinne eines kybernetischen Systems auf, wobei es sich um eine – in der Regeltechnik nicht erwünschte – als «progressiv gesteuert» bezeichnete Ausregelung auf eine einmalige Störung am «Regler-Eingang» handelt. Die formelmässige Beschreibung des zeitlichen Verhaltens leistet eine Differentialgleichung zweiter Ordnung vom Typ der Schwingungsgleichung.



Das Verhalten der Mitoserate nach der Applikation von DMSO.

Wir nehmen an, dass für diesen DMSO-Effekt vornehmlich die epidermalen Lysosomen als relevant anzusehen sind. Es ist nämlich bekannt, dass der lysosomale Inhalt eine mitogene Wirkung ausübt[4]. Weiterhin wurde kürzlich gezeigt[1], dass die einmalige Anwendung von DMSO auf die Meerschweinchenhaut einen vorübergehenden Schwund der sauren Phosphatase-Aktivität bedingt, was sich gut mit der Labilisierung (Perforation?) der lysosomalen Membran erklären lässt. Übrigens haben schon ABRAHAM et al.[5] gezeigt, dass Teilungsfiguren 11 bis 24 h nach Schädigung der lysosomalen Membran infolge einer Hypoxie vermehrt auftreten. Das stimmt in etwa auch mit unseren Beobachtungen überein. Es bleibt ungeklärt, ob die lysosomalen Enzyme auf die Repressor-Moleküle, wie etwa auf Chalone (dazu auch GELFANT und CANDELAS[6]), einwirken.

Summary. 12 h after local application of DMSO on the epidermis of the mouse, increased mitotic activity has been observed, the maximum occurring 24 h after the onset of the experiment. Subsequently a distinct reduction of the frequency of mitosis can be seen with a minimum occurring about 53 h after the beginning of experiment. The initial mean value is reached 12 h after.

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Ultrastructural Features of Pituicytes in the Neural Lobe of Adult Rats. The Peripheral Processes

The fine structure of pituicytes has been synthetically investigated in previous reports[1,2]. This note concerns the submicroscopic configuration of the cytoplasmic peripheral processes which are characteristic of pituicytes.

Materials and methods are the same as described in a previous note[1].

The pituicytic peripheral processes emanate from the perinuclear cytoplasmic zone and are interposed among the neurosecretory fibers typical of the neural lobe (Figure 1). Such processes are elongated in shape and contain various organelles as lipid droplets, mitochondria and profiles of endoplasmic reticulum: in particular, they show filamentous structures, namely microtubules and filaments which are longitudinally oriented along the major axis of processes themselves (Figures 1 and 2). Lipid droplets are often arranged according to a linear array and sometimes surrounded by elongated cisternae of the rough endoplasmic reticulum (Figure 3). Quite large neurosecretory ibers may impinge on pituicytic processes and be invaginated into them. Small processes converge at some areas with each other, being interconnected by junctional complexes[3], the cytoplasmic sides of which are rich in dense and amorphous material (Figure 4). In general they appear as desmosome-like complexes[3], but further studies are necessary to investigate them.

The irregularity of the pituicytic shape is especially due to the presence of many elongated processes emanating from the pituicytes themselves. They contribute to form a cellular network which permeates the hypophyseal neural lobe. It is well known that in rats – as in rabbits – the neural lobe is also permeated by an interlobular perivascular network, possibly acting as a temporary neurohormonal store[4]. The pituicytic processes form another network – cellular in character – which increases the surface contact between pituicytic cells and neuro-

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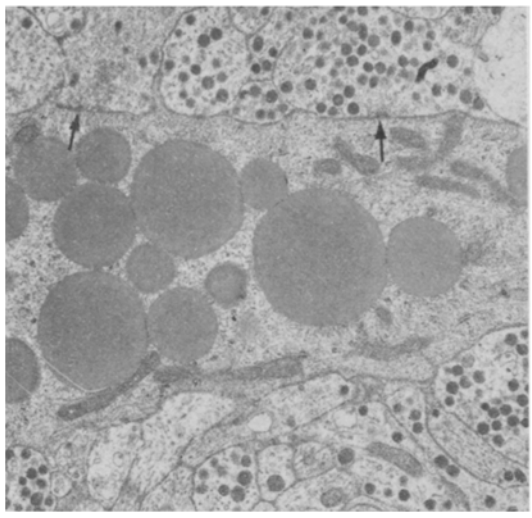

Fig. 1. Neural lobe. A pituicytic process is shown containing variably-shaped lipid droplets, filamentous structures, mitochondria and small endoplasmic reticulum profiles. Note 2 synaptoid contacts (arrows). ×11,250.

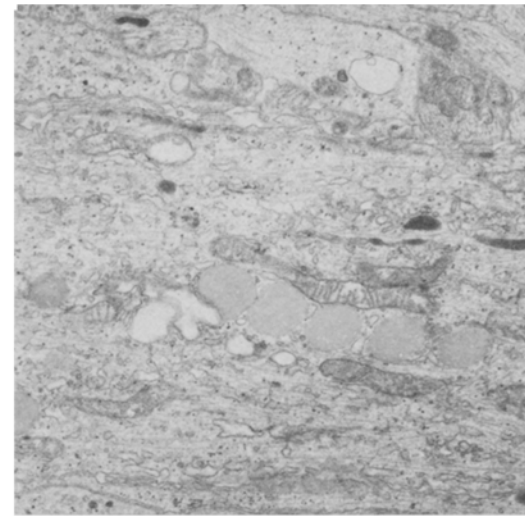

Fig. 2. Neural lobe. One pituicytic process contains many organelles but especially linearly arranged lipid droplets and abundant longitudinally oriented filamentous structures. ×12,900.

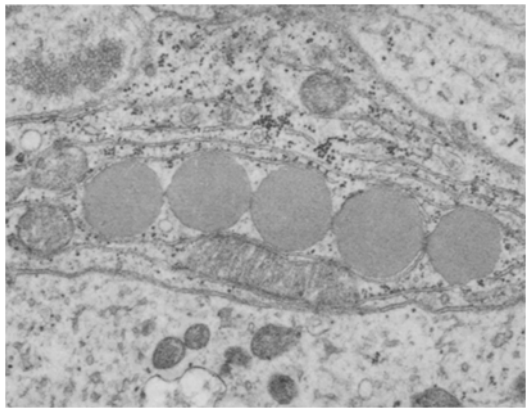

Fig. 3. Neural lobe. Linearly arranged lipid droplets are surrounded by elongated cisternae of rough endoplasmic reticulum. ×16,250.

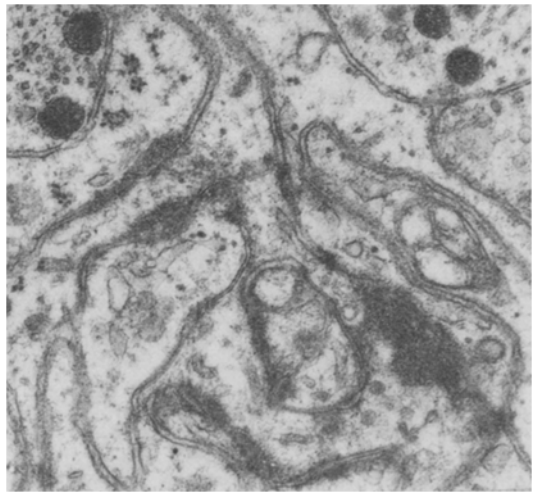

Fig. 4. Neural lobe. Labyrinthic configuration of confluencing pituicytic peripheral processes with many interpituicytic junctional complexes characterized by an abundant quite electron-dense amorphus material. ×28125.

secretory fibers, thus being a morphological expression of the functional and trophic relationship between the pituicyte and the surrounding fibers. In this connection, the synaptoid contacts already described[5-7] are a specific expression of such relationship being also quite frequent at the level of pituicytic processes (Figure 1).

Furthermore it is possible that the filamentous structures contained within pituicytic processes may be involved in the mechanism of migration of cytoplasmic organelles or specially metabolic products according to the functional local requirements, in a way not dissimilar from other cell types rich in filamentous structures: the neuronal axoplasmic flow really is a typical microtubule-dependent device for the migration of cytoplasmic organelles and trophic substances[8].

Finally the existence must be emphasized in the neural lobe of circumscribed zones of specialized interconnection between the terminal ramifications of pituicytic processes: such junctional zones may possibly represent specific sites both of mechanical interconnection and of metabolic interpituicytic exchange.

Riassunto. Sono state analizzate le caratteristiche ultrastrutturali dei prolungamenti citoplasmatici dei pituiciti i quali formano un reticolo cellulare atto ad aumentare la superficie di contatto tra i pituiciti e le fibre neurosecretorie.

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