bovine, pickerel and chick fibre cell polypeptide all share the constellation of peptides indicated by the open arrow in figure 4. Differences are however evident, and peptides unique to each species are indicated by the closed arrows. There is a greater correspondence between bovine and chick peptide patterns than between these and the pickerel pattern.

The results obtained in this study show that the proteins of the lens fibre cell cytoskeleton are a complex of unique polypeptides distinct from the crystallins. Aside from species differences the noncrystallin polypeptides fall in 3 major mol.wt categories: 250,000 daltons, 82,000–105,000 daltons, and 43,000–45,000 daltons.

The 54,000 dalton polypeptide is identified as the major component of the lens intermediate filament. Similar results have been reported for the bovine lens[6]. Peptide analysis showed a great similarity between the chick and bovine polypeptides. The pickerel protein has a more distant relationship. The 43,000 dalton polypeptide comigrates with actin under the electrophoretic conditions described here. The presence of actin in the bovine lens has been documented[6]. The role of cytoskeletal proteins in the lens fibre cell awaits further study.

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Maternal regulation of wing polymorphism in *Pyrrhocoris apterus:* Effect of cold activation

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Summary. In a macropterous strain of *Pyrrhocoris apterus* the offspring of females kept under long-day conditions are invariably mostly macropterous, whereas the offspring of females from short-day conditions become macropters under long-day and brachypters under short-day conditions. The brachypterizing effect of short days was removed by the chilling of mothers for 70 days.

In *Pyrrhocoris apterus* L. (Heteroptera, Pyrrhocoridae) the membranes of the forewings are either reduced (brachypters) or fully developed (macropters). In wild population in Central Europe the penetration of this character is environmentally controlled (largely by photoperiods)[1]. We selected a strain whose members developed into macropters under any photoperiodic conditions, provided the parents lived under long-day conditions[2]. Under short-day conditions the imagines of this strain are in diapause, but after some time (30–50 days) some females spontaneously begin to lay eggs. The reactions of the offspring of these short-day mothers differ from those of mothers from long-day conditions.

The 29th–31st generations of the strain selected for macropterism were used. The insects were kept in groups in plastic boxes and supplied with linden seed and water. They were kept either under a 12 h-light:12 h-dark photoperiod (short-day) or a 16 h-light:8 h-dark photoperiod (long-day) and at a temperature of 25–27 °C. In short-day conditions the females were either left to lay eggs spontaneously or they were activated by a) transfer to long-day conditions, b) chilling at temperatures of 3–10 °C for 70 days, or c) by injury – cutting of the wings. The line kept under long-day conditions served as the control.

The offspring of females reared under long-day conditions consists of about 90% of macropters and 10% of brachypters if the larvae are reared under long-day conditions or there are about 60–70% of macropters if they are reared under short-day conditions. There was no difference among the offspring of mothers reared continuously under long-day and those transferred into long-day as imagines. The progeny of females reared under short-day conditions mostly become brachypters if held under short-day conditions as larvae (about 25% of macropters). The production of brachypters lasts for the whole life of short-day mothers (about 2–3 months). Under long-day conditions the offspring of

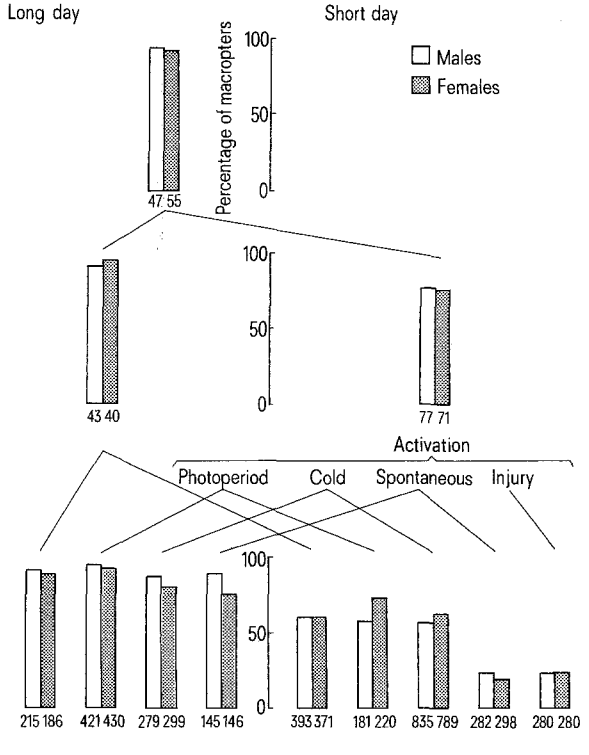

Fig. 1. The percentage of long-winged individuals (in 3 successive generations) when parents and progeny at the larval stage have been subjected to different treatments. Number of individuals in each sample given below each column.

short-day mothers mainly develop into macropters (80–90% macropters) (figure 1).

The prolonged exposure of short-day females to cold terminates the diapause and induces immediate oviposition under short-day conditions[3]. The cold treatment also increases the percentage of macropters, even when both the mothers (before and after chilling), and the progeny larvae are held under short-day conditions. The proportion of macropters increases to about 60% and approaches that of long-day activated mothers. Also, the wounding of short-day females elicits oviposition in a large portion of diapausing females. In contrast to cold activation, however, it does not increase the proportion of macropters among their short-day offspring (25% of macropters). If larvae are held under long-day conditions the proportion of macropters is high after cold treatment as well (figure 1).

Young unchilled females transferred from long-day to short-day conditions ceased laying eggs after about 20–25 days. Before this cessation, however, the production of macropters turned to the production of brachypters at about day 12–13 (figure 2). Thus, if not activated by chilling, the mothers remain sensitive to photoperiods.

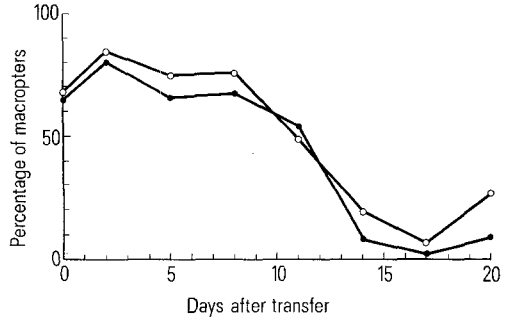

Fig. 2. The decrease in the proportion of long-winged individuals among the offspring (reared under short-day conditions as larvae) of parents transferred from long-day to short-day photoperiodic conditions. ●——● males, ○——○ females.

The maternal influence on wing polymorphism in the progeny has been demonstrated in several aphid species[4]. In viviparous aphids young embryos within the maternal body may be influenced by the physiological condition of the mother. In other insect groups, however, the mediation of maternal influence on wing polymorphism to progeny through the egg stage has rarely been observed. Perhaps the only case known is *Nilaparvata lugens* (Homoptera, Delphacidae)[5,6]. In *P. apterus* this mechanism could clearly be demonstrated only in a selected strain. In wild material in the open, its possible contribution to the determination of morphology would be of little importance. The species has in principle one generation per year, the eggs are laid by overwintered chilled females, and the larvae develop mostly under long-day conditions[7]. Thus, as far as populations of Central Europe are concerned, the maternal influencing of wing form is a hidden potentiality of the organism, perhaps without biological meaning for the life of the species.

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Effets de la température d'élevage sur la croissance et l'équilibre hormonal de *Schistocerca gregaria* au cours des deux derniers stades larvaires

Effects of the rearing temperature upon growth and hormonal balance in *Schistocerca gregaria* during the last two larval instars

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Summary. A fall in diurnal rearing temperature (from 33 °C to 28 °C) during the 2 last larval instars of *Schistocerca gregaria* induces a lenghthening of development and a slowing down of growth. At 28 °C, circulating levels of juvenile hormones, particularly those of JH_3, diminish from the middle of the 4th instar but ecdysteroids and proteins accumulate in haemolymph.

L'existence de perturbations physiologiques graves, mais réversibles, liées à la température d'élevage a été démontrée chez les adultes de *Schistocerca*[1-4]. Chez ces criquets, un abaissement de 30 à 28 °C de la température diurne suffit à stériliser totalement les mâles en provoquant des anomalies de la spermiogenèse et détermine, chez les femelles, des troubles de la vitellogenèse qui s'opposent, non à la ponte, mais au développement des oeufs fécondés. En outre, les animaux élevés à 28 °C présentent une rétention des produits de neurosécrétion dans la pars intercerebralis et manifestent un freinage de l'activité sécrétrice des corpora allata et des lobes glandulaires des corpora cardiaca[5].

Nous abordons ici l'étude des répercussions de la température d'élevage sur la physiologie des larves des 2 derniers stades.

Matériel et méthodes. Les larves sont élevées en groupes denses depuis l'éclosion. La durée d'éclairement journalier est de 12 h, la température diurne de 33 ou 28 °C. L'humidité relative est automatiquement maintenue à 30–35%. Le poids sec des animaux est obtenu après dessication à 60 °C pendant 72 h. Le dosage des protéines (méthode du biuret) est pratiqué sur l'hémolymphe après une centrifugation (9600 × g; 20 min; 4 °C) qui élimine les hémocytes. Les moyennes rapportées pour ces 2 paramètres (figure 1) concernent des ensembles de 10–20 individus de chaque sexe.

Le dosage radioimmunologique (RIA) des ecdystéroïdes est réalisé à partir de prélèvements de 10–20 µl d'hémolymphe[6,7]. Dans le système utilisé, c'est la somme de l'ecdysone et de l'ecdystérone qui est mesurée[6].

Le RIA des hormones juvéniles (JH), JH_1 et JH_3 est réalisé