This activity is dependent upon cell metabolism and activated by environmental factors[13].

Riassunto. E'stata esaminata l'azione di estratti embrionali di 6 e 12 giorni e del siero di pollo sul differenziamento in vitro di epidermide di 6 giorni di incubazione. I risultati ottenuti hanno permesso di precisare alcuni aspetti del rapporto epitelio-mesenchima nel corso del differenziamento della cute.

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Synaptonemal Complexes in the Ovaries of *Galleria mellonella*

The multiplication of the oogonial cells – cytoblasts – in insects ovaries (according to the terminology of KOCH et al.[1]) takes place during the course of the larval life. The nuclear events in the ovary which follow this period are: 1. polyploidization of the cells which become trophocytes and 2. onset of meiotic prophase of those which are becoming oocytes. In *Drosophila* these differentiation processes begin during the pupal stage and continue throughout the adult life[1]. In Lepidoptera, according to DEPDOLLA[2] the oogonial cell divisions last until the 4th larval stage. The number of larval stages, however, is not fixed for this group. It varies in different species depending on the environmental conditions. In *Galleria mellonella* the cytological observation of the ovary from spinning larvae taken from the cocoon indicate that the process of oocyte differentiation, namely meiosis, may start prior to pupation. In such ovaries, the nuclei with synaptonemal complexes may be found.

Material and methods. The larval ovaries were fixed in 2% glutaraldehyde, pH 7.3 buffered with Na-cacodylate, and postfixed, after washing, with 1% osmium tetroxide. Epon embedded material was sectioned on Reichert

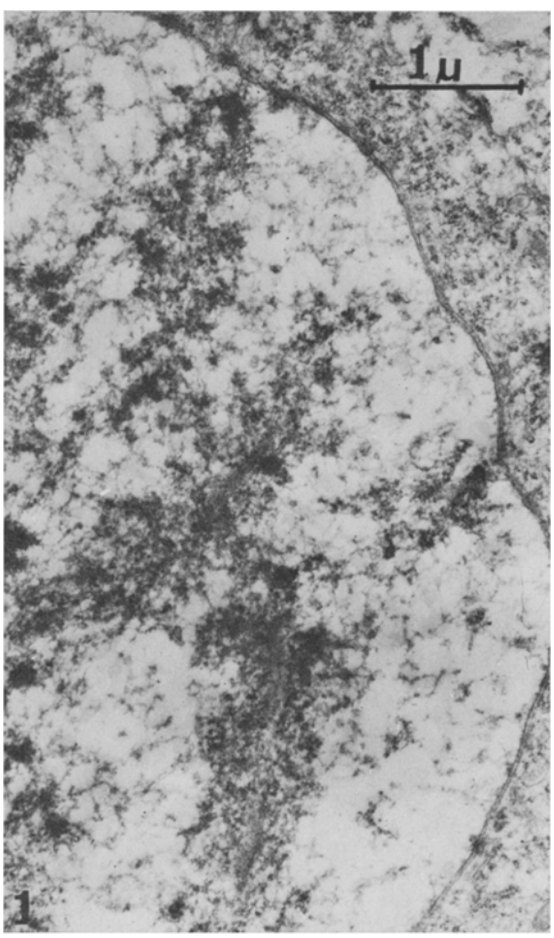

Fig. 1. Ovary of a spinning larva of *G. mellonella*. Fragment of an oocyte nucleus with synaptonemal complexes.

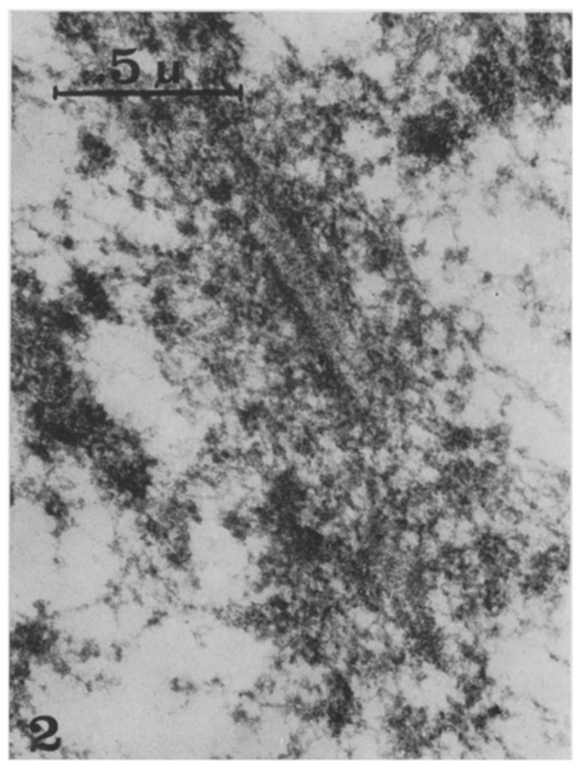

Fig. 2. Ovary of a spinning larva of *G. mellonella*. Another example of a synaptonemal complex in oocyte nucleus.

[1] E. A. KOCH, P. A. SMITH and R. C. KING, J. Morph. *121*, 55 (1967).

[2] Ph. DEPDOLLA, in *Handbuch der Entomologie* (Ed. Ch. SCHRÖDER, Jena 1928).

ultratome and examined in JEM 7A electron microscope. The thin sections were contrasted with uranyl acetate following with lead staining[3–5].

Results and discussion. Figures 1–3 present synaptonemal complexes, similar to those observed by KING et al.[6] in the pupal ovary of *Drosophila*. They have a typical ribbon appearance of structures with 2 dense lateral lines and a thin, delicate one lying centrally. In the two clear interspaces, delicate microfibrils oriented radially may be found. In some cases the attachment of this complex to the nuclear membrane is seen (Figure 3). Their appearance may be assumed, similarly as in the other species known from the literature[6,7], to be a sign of crossing-over process which apparently occurs in *Galleria mellonella*.

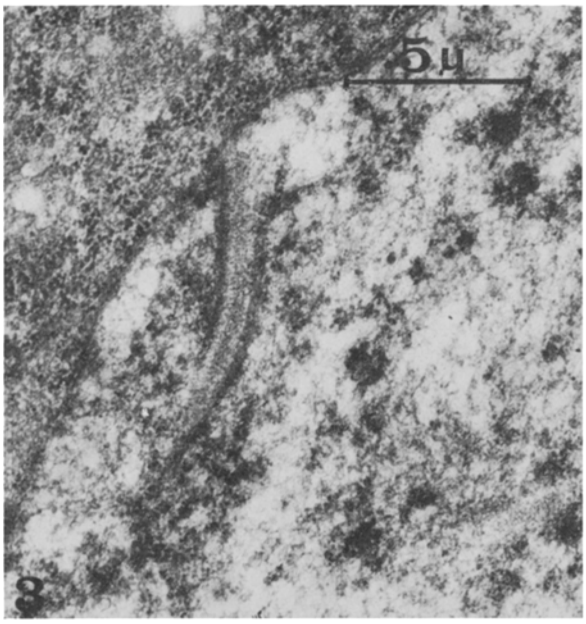

Fig. 3. Ovary of a spinning larva of *G. mellonella*. Fragment of an oocyte nucleus with a synaptonemal complex attached to the nuclear membrane.

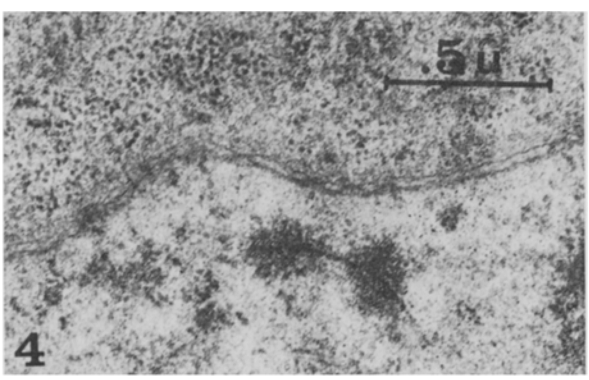

Fig. 4. Fragment of a trophocyte nucleus from vitellogenetic egg vesicle of a newly hatched imago of *G. mellonella*. Cross section of a synaptonemal complex is seen.

The morphological chromosomal pattern suggesting the presence of this process has also been found in a trophocyte nucleus from a differentiated egg vesicle, in the course of vitellogenesis (Figure 4). According to DEPDOLLA[2] in the Lepidoptera egg vesicles, the trophocytes in the larval ovary may also, like their sister-cell oocyte, initiate the differentiation by entering meiosis. This is, however, soon replaced by endomitosis. The cross section of the synaptonemal complex presented on Figure 4 has been found in the trophocyte nucleus in advanced polyploidy and may be regarded as a sign of somatic crossing-over occuring in this cell. The possibility of such cytological phenomenon was reported in the literature. KAUFMANN[8] observed in *Drosophila melanogaster* the occasional presence of chiasma-like configurations between homologous chromosomes in somatic cells, before the genetic evidence for somatic crossing-over was manifested. STERN[9] and LECLERC[10] observed the phenotypic expression of occurence of somatic crossing-over in these flies. SCHULTZ[11] found in the nuclei of salivary glands and in the nurse cells of the ovary a 'regular pairing of chromosomes which may – but does not necessarily – signify crossing-over'. By means of the electron microscope study, in the trophocytes of egg vesicles of mosquito, multiple synaptonemal complexes were found[12]. They are similar to those observed in the oocyte nuclei of *Acheta domesticus*[13]. In both cases their presence is considered to be related to the specific gene amplification.

It must be noted that the picture presented is the unique one, in the case of trophocytes of *Galleria mellonella*, follows from the many electronograms examined of both various areas of the same nucleus, and of trophocytes belonging to different ovarioles. Such a low frequency of genetic exchange between homologues in these cells might be accounted for by the random contact[14].

Résumé. Dans les oocytes de *Galleria mellonella*, on a trouvé des complexes synaptonémaux, indiquant la présence de crossing-over dans cet organisme. Le complex synaptonémal s'est montré aussi dans un trophocyte, mais il semble être ici un phénomène accidentel.

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