Our results show clearly that the strong attenuation of the sensitivity of the eye in the early part of dark adaptation is not only due to the loss of receptor sensitivity. It is also due to a neural process occurring in the retinal visual pathway, either between the receptors and the inner nuclear layer or within the inner nuclear layer itself.

Riassunto. Risposte elettroretinografiche sono state registrate dall'occhio di gatto. Sono state studiate le variazioni di ampiezza dell'onda *b* e del potenziale del ricettore (isolato tramite fotocoagulazione dell'arteria retinica) durante l'adattamento all'oscuro. L'analisi dei risultati ha dimostrato l'esistenza di uno stadio nervoso nell'adattamento all'oscuro con sede anatomica fra il ricettore e lo strato dei granuli interni.

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Thymidine H^3 Incorporation in the Nurse Cells of Amphigonic and Parthenogenetic Ovaries of *Megoura viciae* (Hom. Aph.)

Autoradiography has shown that the nucleus of the nurse cells of some insects incorporates thymidine H^3 during the ovocyte growth. This has been attributed to continuous endomitotic divisions. Such researches were restricted, however, to nurse cells of amphigonic insects.

It therefore appeared particularly interesting to extend the study of the functioning of nurse cells to species of aphids. In such species both amphigonic and parthenogenetic female individuals are present. The former carry ovaries with large polyploid nurse cells and the latter are viviparous and carry ovaries with very small nurse cells which are diploid as a rule and always the same size. Only in *Aphis fabae* parthenogenetic individuals were tetraploid nurse cells shown to be present[1]. The present research was carried out on *Megoura viciae*, which is easily bred in controlled environment.

Amphigonic and parthenogenetic females of the species at various stages of development were injected in the abdomen with 0.1 μC of thymidine H^3. At intervals of time ranging from 1 h to 4 days after the injection, the animals were fixed and embedded in paraffin. The slides were subjected to autoradiographic processing, using the 'stripping film' technique. Some were stained with the Feulgen reaction before autoradiography, and some with the Unna method after autoradiography.

A very clear thymidine H^3 incorporation was observed in the nuclei of the differentiating nurse cells of very young amphigonic females. Incorporation can also be distinctly observed in fully developed nurse cells which are connected by a cytoplasmatic bridge to the growing ovocyte (Figure 1).

Not all the nuclei, however, were affected, as previously shown in *Dytiscus*[2]. It should also be pointed out that, once the process of vitellogenesis is over, no further incorporation of thymidine occurs in the nuclei of the nurse cells.

In the ovaries of parthenogenetic females, in which ovocytes at various stages of vitellogenesis and embryos at various stages of development are present, a very clear incorporation of thymidine in the nuclei of the nurse cells occurs (Figure 2). Incorporation is not synchronous throughout the nurse cells; cells with an unlabelled nucleus may be found side by side with others which have actively incorporated thymidine in one and the same ovary. So DNA synthesis is asynchronous in these as in polyploid nurse cells.

Conclusions. In the amphigonic females of *M. viciae* an active nuclear incorporation of thymidine H^3 occurs during growth which may be attributed to continuous endomitotic divisions. However, even when the nurse cells are functioning fully, and when the nuclei appear to have achieved maximum development, incorporation of the thymidine H^3 continues, and, as was seen in other insects, does not affect all the nuclei. Incorporation would therefore seem to be due not to the continuance of endomitotic divisions but rather to the synthesis of metabolic DNA. On the other hand, even if one supposes that in the nurse cells of the amphigonic ovary endomitotic processes continue right up to the end of vitellogenesis of the amphigonic winter egg, this is quite out of the question so far as the parthenogenetic ovary is concerned.

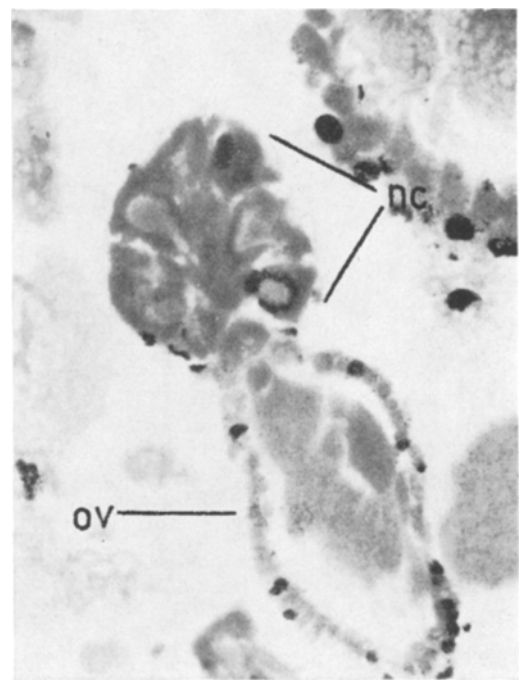

Fig. 1. Amphigonic ovary showing thymidine H^3 incorporation in polyploid nuclei of nurse cells. Notice the unlabelled nucleolus. Stained by Unna. × 310. n.c. = nurse cells; ov = ovocyte.

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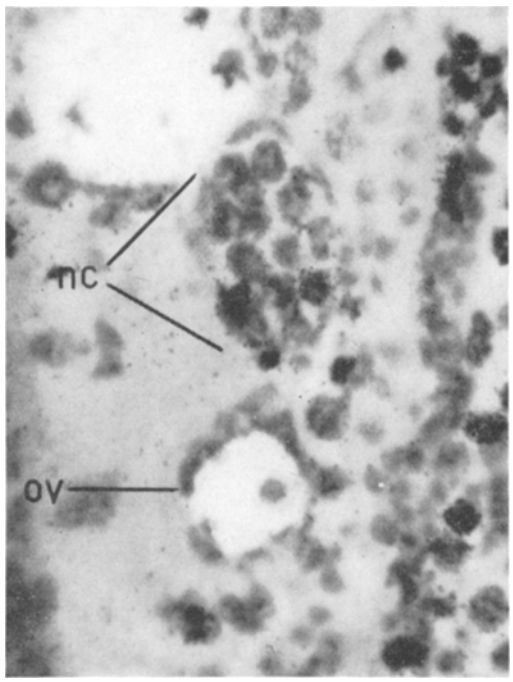

Fig. 2. Parthenogenetic ovary showing thymidine H^3 incorporation in diploid nuclei of nurse cells. Stained by Feulgen. × 980. n.c. = nurse cells; ov = ovocyte.

Diploid nurse cells are functioning continuously, since in a parthenogenetic ovary a great many ovocytes reach maturity one after the other, passing through all stages of development to produce the embryos. The nurse cells always retain, in such cases, their characteristic appearance right from the beginning of their differentiation[3] and therefore thymidine H^3 incorporation cannot be ascribed to continuous endomitotic divisions. It can therefore be assumed that the active synthesis which occurs in the nuclei does not concern genetically stable DNA but a metabolic DNA. The above results thus add new weight to the assumption by former authors[2,4] that metabolic DNA may be synthesized in the nurse cells of amphigonic insects as well.

Riassunto. Nell'afide *Megoura viciae* le cellule nutrici diploidi dell'ovario partenogenetico e quelle poliploidi dell'ovario anfigonico si comportano in maniera analoga incorporando timidina H^3 durante l'accrescimento ovocitario. Tale incorporazione viene attribuita alla sintesi di DNA metabolico.

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Immunofluorescent Antibody Studies of a Murine Leukemia Virus: Comparison of Human, Bovine and Murine Systems

The immunofluorescent antibody test is specific and allows a visualization of the viral antigenic site in the S-63 murine leukemia system[1,2]. Sera from mice convalescing from S-63 virus infection react with the S-63 virus but fail to react with normal mouse antigens, presumably because of their viral antibody contents. The present study explores the question whether the S-63 leukemia antibodies react with human and bovine leukemia antigens.

Material and methods. The following materials were used as antigens in our study: normal and leukemic tissues of man, normal and lymphomatous bovine tissues[3], normal mouse, S-63 and GC virus-induced leukemic mouse tissues. In each case spleen, lymph node, liver, brain, and kidney were studied.

Of the types of leukemia studied, 2 were acute lymphoblastic; 6 acute myeloblastic; 1 acute myeloblastic (possibly erythroleukemia); 2 chronic lymphocytic; 1 chronic granulocytic; 4 lymphomas; 2 lymphoblastic lymphomas; 2 mast cell disease.

Cell suspensions and touch preparations were made from each, as previously described[1].

Antisera. Pools of sera were collected from: normal ICR mice (NM), convalescent S-63 infected ICR mice (LM), rabbits made immune tolerant to S-63 virus (ITM63L), normal rabbits (NR), rabbits made immune tolerant to normal human tissues and then challenged with human leukemic tissues (ITHL), normal human (NH), leukemic human (LH), human volunteers injected with leukemic antigens (HV)[4], and laboratory workers handling leukemic antigens (LW)[5].

Immunofluorescence techniques. The direct, indirect, and indirect complement-fixing fluorescent tests of Cherry et al.[6] were employed. In all cases fluorescein isothiocyanate (FITC) was the fluorescing dye. Commercially prepared (Pentex Corp.) anti-guinea-pig serum conjugates were used in the indirect complement-fixing tests. All sera were absorbed against normal tissue antigens and silk fibroin[1].

All sera were tested by complement-fixation (CF), immunodiffusion (ID), and passive cutaneous anaphylaxis (PCA) tests. It is necessary to predetermine the presence of complement-fixing antibody. This is to insure a reliable indirect complement-fixing fluorescent test.

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