

change: on observe le démarquage des noyaux, accompagné de l'augmentation de la radioactivité du cytoplasme (Tableau).

Localisation des traces dans les cellules du méristème racinaire de *Vicia faba* des plantes incubées avec l'adénine-<sup>14</sup>C à 4° et transférées à 18°

Durée d'incubation à 18°	Nombre de traces/100 cellules et % d'activité totale		Noyau		Cytoplasme		Total %
	Nucléole %		%		%		
0	137	19	308	37	258	44	703 100
1	165	18	403	43	366	39	934 100
3	92	9	334	33	592	58	1018 100
5	69	7	285	31	580	62	934 100

### Inhibition of Diapause in *Pieris rapae* L. by Brief Supplementary Photophases

Unlike plants which show effects from interrupting the period of darkness by only a few seconds of light<sup>1</sup>, the light-phase reactions in insects and mites have been assumed to develop slowly<sup>2</sup>. Thus, when the effect of light on insects is studied, rearing in 'total darkness' is commonly reported without explaining how the test insects were fed, cleaned, or observed. This report purposes to show that *Pieris rapae* L. resembles many other animals<sup>3</sup> in responding to short photophases if the exposure to light occurs at a critical time.

Interruption of the dark period by 0.5 to 2 h of light was found by BÜNNING and JOERRENS<sup>4</sup> to inhibit diapause most effectively at 14-16 h after the start of the 'main light period' in a 24 h cycle whether the main light period is 1, 6, or 12 h. These authors suggest that with the start of the photophase, a physiological stage lasting about 12 h occurs in which light promotes diapause. This stage is followed by one in which light suppresses diapause. They assert that a critical period of darkness is not essential. In their tests a photophase of 0.5 h inhibited diapause less effectively in *Pieris brassicae* L. than did 2 h of interrupting light. The shortest photophase otherwise found to affect arthropod diapause had been 1 to 3 h<sup>5-15</sup>. Most of these experiments were designed to test whether the light or the dark phase was the determinant and to detect possible additive effects of either phase. Re-examination of the published data tends to support the endodiurnal rhythm postulated by BÜNNING and JOERRENS<sup>16</sup>.

The present tests on *Pieris rapae* L. employed a 10 h main light period (1400 to 0000 daily) in a 24 h cycle. Supplementary light phases were added either to end 14 h after the start of the 10 h light period (0400) or to start 14 h before the end of the 10 h light period (1000). Effects of supplementary photophases of 150, 90, and 30 min on *P. rapae* have been reported<sup>17</sup>. In present tests identical techniques on 5, 8, and 17 min photophases were used.

When the interrupting photophase followed (off at 0400) the 10 h light period, the proportions of insects entering diapause at 20°C were 0/146 for 90 min, 3/119 for 30 min, 0/38 for 17 min, 0/75 for 8 min, 0/110 for 5 min, and 100/105 for no interrupting light. When the interrupting photophase preceded (on at 1000) the 10 h light

En conclusion, l'incorporation cytoplasmique des pré-curseurs de l'ARN et des protéines à 4° est plus atteinte que l'incorporation nucléaire; il est bien possible que cette altération soit due à l'inhibition du transfert de l'ARN du noyau au cytoplasme.

**Summary.** The uptake of labelled RNA and protein precursors in *Vicia faba* root meristems into nuclei at 4°C is less depressed than in the cytoplasm. Reversion of the normal pattern of incorporation would seem to indicate an inhibition of the RNA transfer from nucleus to cytoplasm.

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period, the proportions of diapausing insects were 3/121 for 150 min and 62/73 for 5 min.

These results agree with those of BÜNNING and JOERRENS<sup>16</sup> in that a supplementary photophase is more effective nearer the end of the main photophase. Even 5 min is not the limit of an effective inhibiting supplementary photophase. The timing cams used in these tests were accurate within 1 min; more accurate timers will be needed in finding the shortest effective photophase.

**Zusammenfassung.** Es wurde festgestellt, dass u.a. auch *Pieris rapae* L. auf eine kurze nächtliche Beleuchtung antwortet, die einer wirkungslosen, täglich wiederkehrenden kurzen Photophase hinzugefügt wird. Die bei *Pieris*, gefundene wirksame 5minütige Beleuchtung ist die kürzeste Photophase, die bis jetzt für die Hemmung der Diapause bei Insekten bekannt geworden ist.

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