Butterfly Wings Take Own Pictures

Biophysics

Darkness Does Not Stop Mysterious Action

BUTTERFLY wings give off something—either invisible light waves or a gas—that enables them to photograph themselves in the dark. This curious discovery has been made by Austin Clark of the U. S. National Museum, who is now engaged in trying to find out what the mysterious emanation is.

Mr. Clark mounted the wings of butterflies on paper, which was put on the bottom of a plate box to give a flat surface. A fresh plate, emulsion side down, was placed on it, and the sealed box, with light excluded, put away for a week or so.

When developed the plate had a clear picture of the butterfly wings, complete as to detail and relative intensity of color pattern. Black patches were black, orange areas intermediate, and white areas white, so that on the print black areas came out white and white areas black.

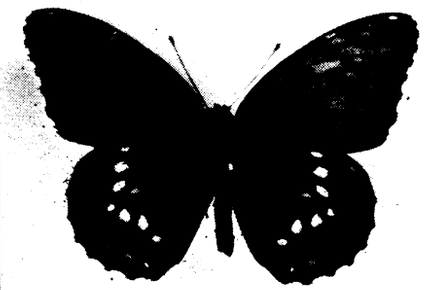
Examine 37 Species

The wings of 37 species of butterflies were examined. Some were perfectly preserved specimens reared in the dark from fully fed caterpillars and never exposed to sunlight; others had been taken in sunlight; and still others had been dead more than 30 years. The effect was less apparent in the case of the 30-year-old specimens than in the fresh ones.

The only anomaly found was that the light spots of the common blue swallow-tail came out as if they were black instead of white—a reversibility previously noted in photographing the Parnassides, another group of the swallow-tail family. Color values were the same on films and plates, whereas photographers say that they are usually, but not always, reversed on films in case of gas emanation, tentatively explained as due to interaction between the gas and the film preservative.

Glass Impenetrable

Exposures were made with parts of the wings covered with thin slips of glass, and others with parts covered with cellophane. The latter substance is very transparent to the short wavelengths of light, while glass is not. The glass obliterated on the negative



Left—The picture the wings took of themselves in the dark after 12 days exposure. Right—A natural picture of the same butterfly before his wings were torn off.

all portions of the wings beneath them, but the cellophane only resulted in a slight dimming of the image, with no alteration of pattern. Hence whatever causes the effect on the plate will not pass a thin cover glass, but will pass through cellophane.

This would seem to lend support to the theory that the effect is due to some kind of light waves rather than to a gas. But when Mr. Clark shielded part of a wing with a bit of thin quartz, which is even more transparent than cellophane to ultraviolet radiation, he found that the quartz blocked off the effect as completely as did glass. This leaves the nature of the cause still in doubt.

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Cows Get Ultraviolet Rays Via Yeast

Physiology

YEAST which has been exposed to ultraviolet rays is better than cod liver oil for increasing the rickets-preventing properties of cow's milk, Dr. Harry Steenbock, Flora Hanning and E. B. Hart of the Wisconsin Agricultural Experiment Station have found.

These investigators have been trying for some time to find a way of increasing the antirachitic property of cow's milk. The majority of infants fed on it get rickets. Earlier observations showed that summer time milk had slightly more vitamin D, the rickets-preventive, than milk produced in winter. Experiments showed, however, that it was not because the cows were getting more ultraviolet light in summer that their milk had more vitamin D in it.

Next experiments with the cows' diet were made. Cod liver oil which prevents rickets in man was not satisfactory when fed to the cows. Fed in large amounts, it lowered the secretion of butter fat. Fed in small amounts it produced little, if any, effect of an antirachitic nature.

Excellent results were, however, obtained from irradiated yeast. Two hundred grams fed daily to cows producing from 30 to 40 pounds of milk increased the vitamin D content of the milk many fold. Even 50 grams furnished enough vitamin D to make the milk highly antirachitic

Apparently by the use of irradiated yeast one of the most outstanding deficiencies of cows' milk can be corrected in a practical way. With the present cost of yeast production, it should be possible to give milk all the vitamin D required for normal nutrition at a cost of a fraction of a cent per quart.

The use of yeast has a further advantage in that the amount of vitamin in the milk can be controlled by the feeding of a standardized yeast preparation in amounts adjusted to the milk production.

The applicability of the use of irradiated yeast for the enrichment of human milk still remains to be worked out.

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