

weed (*Convolvulus arvensis*); Jerusalem artichoke (*Helianthus tuberosus*); prickly lettuce (*Lactuca scariola*); black bindweed (*Polygonum convolvulus*); yellow rocket (*Barbarea vulgaris*); red-top (*Agrostis alba*); common mullein (*Verbascum thapsus*); black mustard (*Brassica nigra*); and burdock (*Arctium minus*). It will be noted that the great majority of these plants are common weeds of European origin.

The Columbus branch of the C. & O. Railroad connects directly with Detroit. Whether this fact is of significance as regards any relationship between the Detroit colony of *A. lineola* and the one at Columbus is, of course, not known.

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THE APPARENT INFLUENCE OF ISOLATION IN SOME SPECIES OF GEOMETRIDAE

by GEORGE F. PRONIN

Much has been written in Europe about melanism in Lepidoptera, sometimes said to be caused by industrial gases. An explanation made was that fumes arising from industries had contaminated the air.

I have observed the dark forms of *Boarmia crepuscularia* Schiff. in two different places: Lutsk, Wolhynia, Poland, and Marienbad, Czechoslovakia. I am satisfied that in both cases the melanistic population resulted from the isolation in which the broods lived.

At Lutsk the broad-leaf host trees of *B. crepuscularia* were surrounded by large fields, and the moths had to mate with their nearest relatives; the introduction of new blood was not readily possible. The situation at Marienbad was similar, only in that case the isolation was caused by a large area of a pure stand of spruce (*Picea* sp.) which extended for many kilometers; the host trees were not numerous on the mountainside near the town, and the beautiful dark *B. crepuscularia* "form nigra" existed only because of the isolation.

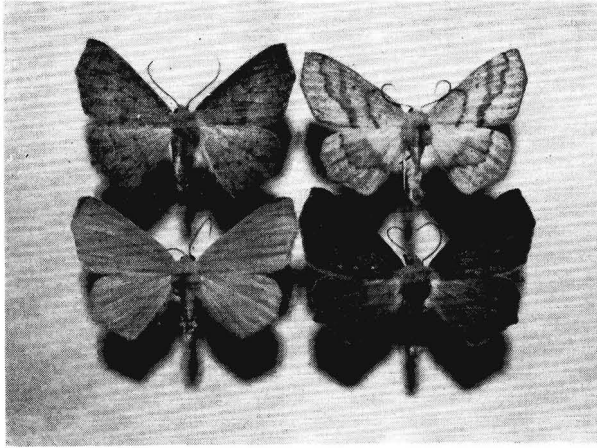
Interesting observations were made of *Amphidasis betularia* "form double-dayaria" dark form (= carbonaria), which I caught in 1943 in the town garden ("Volkspark") of Lodz, Poland, using a caged female of this species.

8 June: a ♂ of *Amphidasis* was attracted and caught; 12, 16, 22 June: each a ♂ of *A. betularia* "f. double-dayaria"; 8 July: I found a pair of this dark form *in copula*, indicating that the population was numerous.

I reared the progeny from the above mating and obtained 14 pupae. The last caterpillar pupated on 31 August 1943. Next year (1944) the moths emerged, all of *A. betularia* f. double-dayaria: 27 May, 2 ♀♀; 29 May, 2 ♀♀; 30 May, 1 ♂; 31 May, 2 ♂♂ and 2 ♀♀; 1 June, 2 ♂♂ and 2 ♀♀. One pupa died, but upon dissection proved to be of the same dark form.

This experiment offered convincing proof that the dark form double-dayaria could not be a result of industrial influence (the mills were not in operation at that time anyhow), but was of genetic origin. The "Volkspark" is isolated by 25 kilometers from the nearest forest.

In California an example of isolation is well shown by *Sabulodes caberata* "form cottlei" in San Francisco. The species is a feeble flier; the San Francisco population, virtually restricted by geography and suburban expansion to Golden Gate and other city parks, is not in contact with the typical form. As a result of such separation there has arisen a dark form which was described as "f. cottlei" by Barnes and Benjamin.



Above: *Sabulodes caberata* Gn. (left) and *S. caberata* "f. arsesaria".
Below: *S. caberata* "f. aegrotata" (left) and *S. caberata* "f. cottlei".

Dr. EDWARD S. ROSS and Mr. HUGH B. LEECH, of the California Academy of Sciences, kindly aided in the preparation of the manuscript and Dr. ROSS took the photograph. I thank them most sincerely.

Literature

- Barnes, William, & F. H. Benjamin. 1926. "A new form of *Sabulodes caberata* Gn. (Lep. Geom.)." *Pan-Pacific Ent.*, vol. 3: p. 41.
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