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The Life Cycle—Metamorphosis



Butterflies and moths go through a life history known as complete metamorphosis. (The word means "change of form.") The female lays many eggs. From these hatch tiny larvae called caterpillars (see *caterpillar*). At this time of their lives they become pests, devouring the food plants of man. The female always lays its eggs on the kind of plant that the caterpillars will use for food.


After several molts (skin sheddings) the full-grown caterpillar is ready to turn into a pupa. At this stage the butterflies and the moths differ. Butterflies spin a button of silk that adheres to a twig, leaf, or other solid support. They then cling to the button by a sharp spine at the end of the body and molt for the last time. As the old caterpillar skin peels off, there appears a naked pupa called a chrysalis. It is an "insect" in the making, enclosed in a tough, flexible shell.

Some moth caterpillars spin silken cases called cocoons inside which they pass the pupal stage. Others burrow into the ground, about six inches below the surface. There the caterpillar molts for the last time. The pupa is covered with a hard, dark, sticky substance that protects it from cold and moisture and from attacks of other insects.

The time spent in the chrysalis or cocoon varies with the kind of insect and with the time of year. It may be weeks or months. The pupa does not appear to be alive, but marvelous changes are taking place. Most of the organs and other tissues of the caterpillar break down, turning into a semiliquid.

From this material are formed the wings, legs, and other parts of the adult. At last the adult is ready to leave the pupa case. If it is an earth-burrowing kind, the pupa, before it opens, is raised to the surface by means of thrashing movements of the insect on the inside. After the insect has freed itself it is wet and its wings are soft and limp. It slowly fans the wings to pump air into the veins. Gradually the wings expand and harden. In a few hours the adult is ready to fly and to seek a mate. Most adults live from four to six weeks. Some live only a few days, some can live as long as ten months.

Enemies and Defenses



Butterflies and moths have many enemies. Birds are among the worst. Various kinds of flies and wasps lay their eggs on or in the bodies of the caterpillars, so the larvae dig in and feed on the tissues.

Both caterpillars and adults have ways of defending themselves. Stinging hairs and spines that may be poisonous protect some caterpillars. The woolly bear caterpillars are covered with a fuzz that makes them an unpleasant mouthful.

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