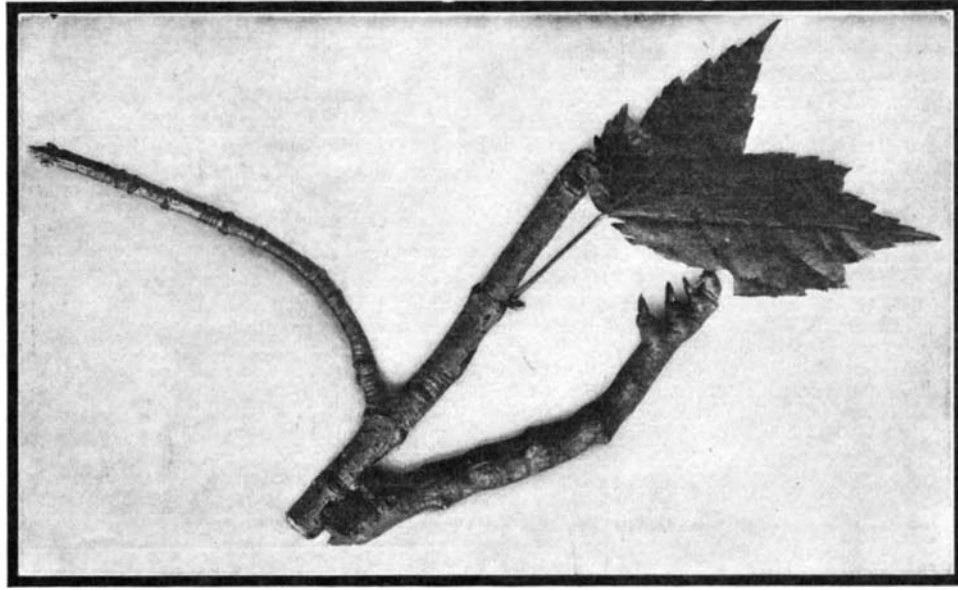


STRIKING EXAMPLES OF INSECT MIMICRY.

BY O. FULDA.

Natural history, including insect study, entomology, is taken up in the public schools, and in walking in the country we often come across our American boys with butterfly nets.

One of the most interesting observations that can be made in the study of insects is the manner in which the animals attempt to protect themselves when pursued by their enemies. There is, for example, among the moths the genus *Catocala*. As a rule, their hind wings have a beautiful, bright coloring, but they can so conceal these under the wing sheath, which is usually gray or brown, that it takes a sharp eye to discover the animals when at rest on the trunk of a tree. A striking fact is that the dark-colored varieties seek concealment on trees with dark bark as, for instance, the oak, while the lighter-colored varieties rest on trees such as the



A Caterpillar (*Eunomos magnarius*) Simulating a Twig.

large, open eyes. It is easily conceived that the animal is able to frighten, when, spreading its wings, it suddenly simulates the appearance of an owl.

The giant Indian moth, *Attacus atlas*, may also be here mentioned. This animal can assume such a position that it represents the head of a certain Indian snake. Its wings when completely spread measure eight inches from tip to tip.

Corks and Their Supposed Induced Radio-Active Effect on Photographic Plates.

BY MYRON METZENBAUM, M.D.

While investigating the action of radium and radio-active substances on photographic plates, I observed that whenever radium, uranium, thorium, or zirconium compounds were placed on a plate of plain glass which was elevated by means of corks above a photographic plate, whenever the corks were directly in contact with the film of the photographic plate, not only did these radio-active substances affect the photographic plate, but an image of the structure of the corks was also to be seen on the plate.

This image of the corks could be noted on the plate after twenty-four hours, and could only be seen while developing the plate, but would wash out almost entirely in the fixing solution.

If the time allowed was at least four days, the action on the plate was sufficiently deep, so the image of the corks remained after the fixing, but it required at least twelve to twenty days before the plate was acted on sufficiently so a good print could be made from the negative.

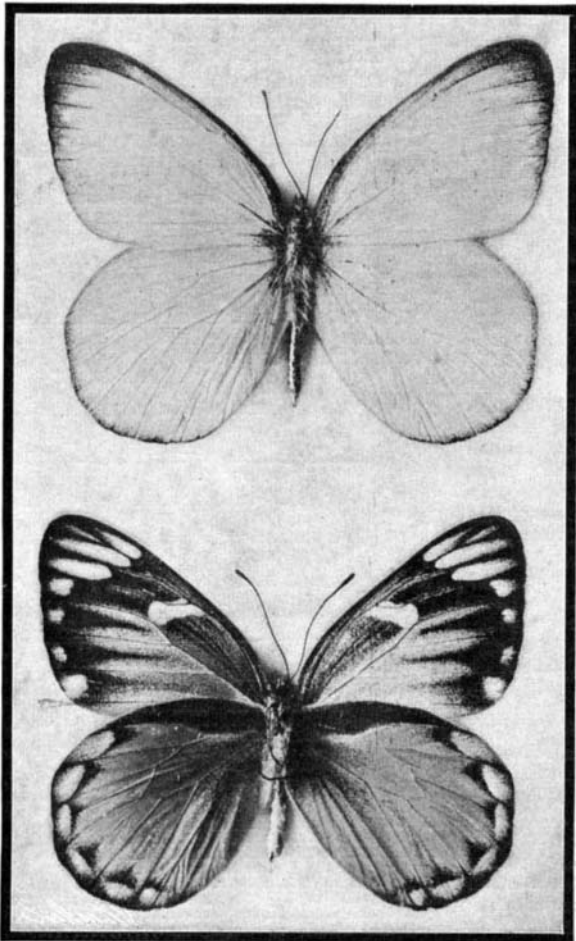
This observation of the action of corks on photographic plates was naturally interpreted as due to induced radio-activity caused from the radio-active substances on the suspended plate of glass, until the time when I made the observation which I reported in the *SCIENTIFIC AMERICAN* of May 14, 1904, on "Induced Radio-activity and Aluminium."

In this article I showed that when radium is contained in hermetically-sealed tubes, and these tubes placed in various solutions and various powders for as long as twenty-one days, after this time neither the solutions nor the powders show the slightest effect on photographic plates; but when the solutions

or powders were placed in aluminium boxes, and these boxes placed in direct contact with a film of a photographic plate, these boxes produced their image at the points of contact. I was able to show further that all sorts of aluminium articles, when placed only in direct contact with the film of the plate, gave an image, and that this action is one not due to radio-activity, but is either a chemical or electrical action between metallic aluminium and the albumenate of silver of the plate, or possibly due to pressure alone.

I therefore took new corks, and placed them in direct contact with the films of photographic plates and kept them out of all possible influences from radio-active substances, and then I noted that the new corks produced their image on the photographic plates just as before.

That this action is one not due to radio-activity may be inferred from the facts that when corks are separated from the film on the photographic plate by a piece of very thin paper, or placed on the reverse side of the plate for as long a time as



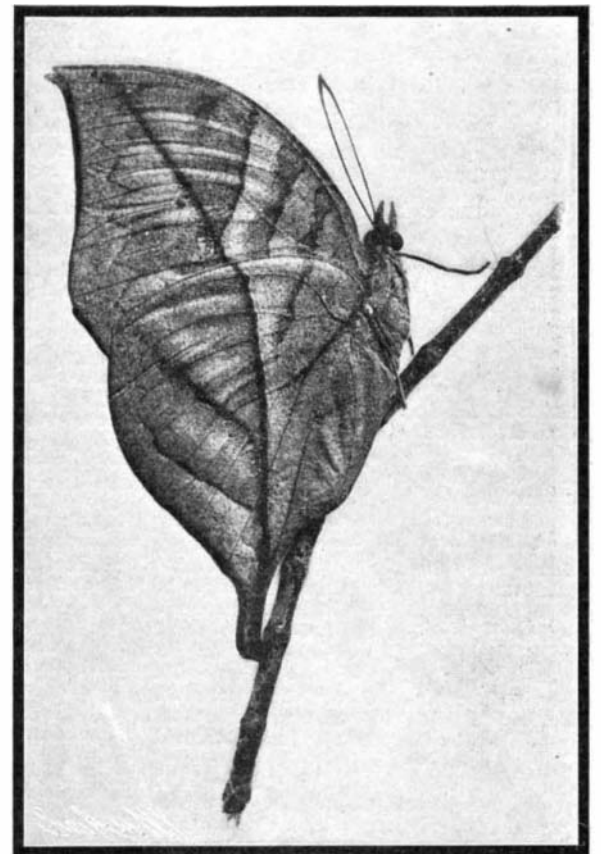
Upper and Under Sides of *Delias des Combesi*, India, Showing the Protective Marking

birch or maple. But the best example of mimicry in the insect world is that which is given us by the leaf imitators, which are brightly colored on top, but when their wings are folded, exactly represent a leaf. One of the most striking examples of this is the *Kallima inachis*, found in India.

Moths are able to deceive the eye in more than one way. There is one species that, when sitting on the bark of a tree, exactly imitates the lichen. Others, when resting on the upper side of a leaf, present the appearance of bird droppings.

Of other insects the "walking stick" can make itself particularly difficult to see, in that it appears like a green or a dry twig according to its color. The caterpillars also of many butterflies and moths imitate their environment. One of our illustrations shows a caterpillar of the *Geometridae*, *Eunomos magnarius*, which always assumes such a position that it is frequently taken for a twig of the plant on which it feeds.

Among the butterflies there are kinds that seek, through their appearance, to frighten their pursuers. The South American *Caligo* species are on the upper side a beautiful blue or gray and blue, while the under side has the color and marking of an owl's head with

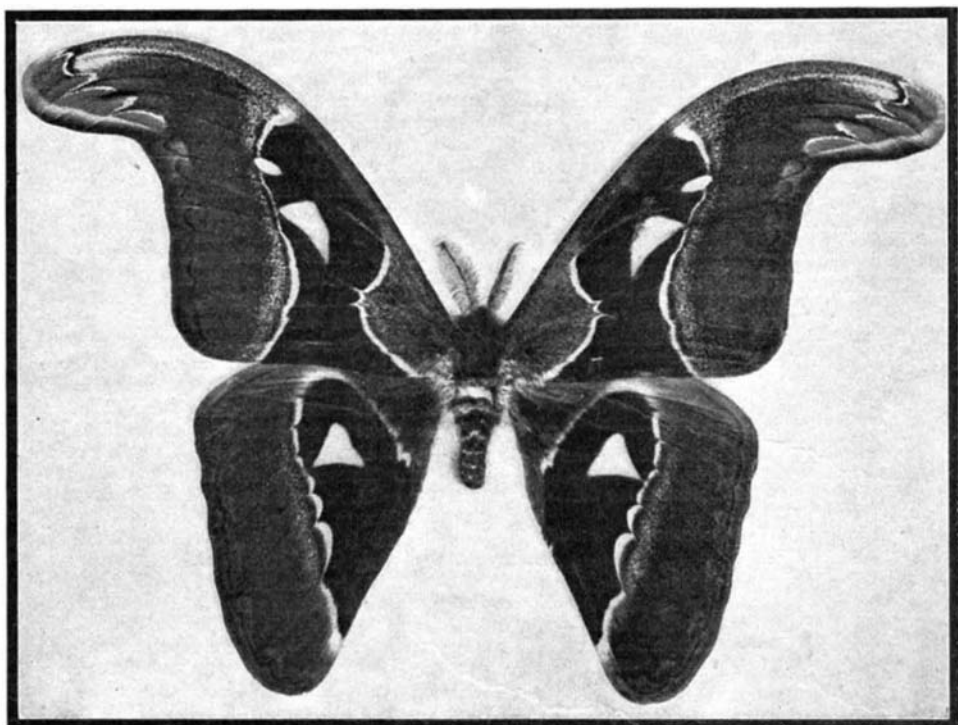


The Indian Leaf Butterfly (*Kallima inachis*) which Mimics a Leaf Even to the Veining.

forty days, the plate is not affected in the least, nor do corks have any effect on the electroscope.

This action may possibly be explained as a chemical one between the residue of chemicals remaining in the corks after their bleaching and the film of the photographic plate, or possibly it may be pressure alone.

In either case this action depends on an intimate contact existing between the corks and the film of the plate, which means that the corks affect the plate only at the points of contact, for it is only the grain of the cork which is seen, causing the picture to seem as though it were a direct photograph.



Attacus atlas, India. Spread of Wings, Eight Inches. Protectively Marked to Resemble a Certain Snake's Head.

STRIKING EXAMPLES OF INSECT MIMICRY.

The construction of a large terminal railway station with every facility for loading and discharging vessels, in basins specially to be constructed, has been decided upon at New Orleans. The situation of this station will be at Chalmette, to the east of the city, and a few miles lower down the Mississippi River. A number of engineers and their assistants are at present engaged taking soundings to a depth of 60 feet, and the ground destined for the works is being planned out. The company is working with San Francisco capital and will construct several basins 1,500 feet long by 250 feet wide, with a maximum depth of 50 feet.