

to contend with while carrying out the natural functions of its species; indeed, it is a life and death struggle between the caterpillar and the fly, for Professor Poulton's experiments revealed the fact that the ichneumon collapsed immediately when a little of the acid was placed upon them, "and either died or took many hours to recover."

Such, then, is a page in the incessant warfare between living creatures that may be enacted unseen beneath the green leaves of a poplar or willow tree; a warfare which has been going on throughout the history of this quaint caterpillar, and has brought such an influence to bear upon it during its struggle for existence as to produce those extraordinary modifications in its anatomy which we have noticed, such as its color simulation of its surroundings, its startling mask, its tail-whips, and its poison-secreting gland.

The ichneumon fly is the natural foe of the caterpillar, and only those caterpillars have survived that have inherited features that would best serve as weapons of defence against the attacks of this wily enemy. On the other side, the ichneumon has concurrently developed quickness of movement to avoid the acid shower and a daring in attack, together with such structural details as sharp claws for holding on and an ovipositor highly adapted for securely placing and fixing its eggs upon the caterpillar.

Should the caterpillar successfully reach maturity, it then prepares for the next stage of its existence. Here, it takes obviously point to much persecution in the past history of its species. The larva selects a suitable crevice in the bark of a tree, into which it withdraws itself. It then proceeds to spin some glutinous threads over its body, attaching them to the bark on either side, afterwards gradually filling up the interstices. While doing this it bites small portions from the bark and weaves them into the substance of the cocoon. When complete and dry the caterpillar is entirely obscured from view, and as the cocoon dries it becomes identical in color with the bark, looking simply like a rugged portion of it; also, it is then as hard as horn. In this position the developing insect spends the winter.

This mimicry of the bark, combined with so much strength, distinctly indicates that the caterpillar has found it necessary to hide itself from the eyes of the enemies, and even then to put on armour. But, notwithstanding all this self-protective care, cocoons may frequently be found torn open and empty, for hungry tits know well how to seek out such choice morsels as the cocoons contain.

The chrysalis is produced when the caterpillar moults its last skin within the cocoon. The thinnest portion of the cocoon is that part where the future moth will emerge the following summer.

In the ordinary way the moth makes its appearance from quite a small round hole near the top of the cocoon, the chrysalis being provided with a kind of

cutting tool for breaking a way through the weak part. When the cocoon is broken the moth emerges from the chrysalis and secretes a fluid, which moistens and softens the ruptured part of the cocoon, and by this means it is enabled to make its way out on to the bark, where its wings develop. Shortly afterwards the moth appears.

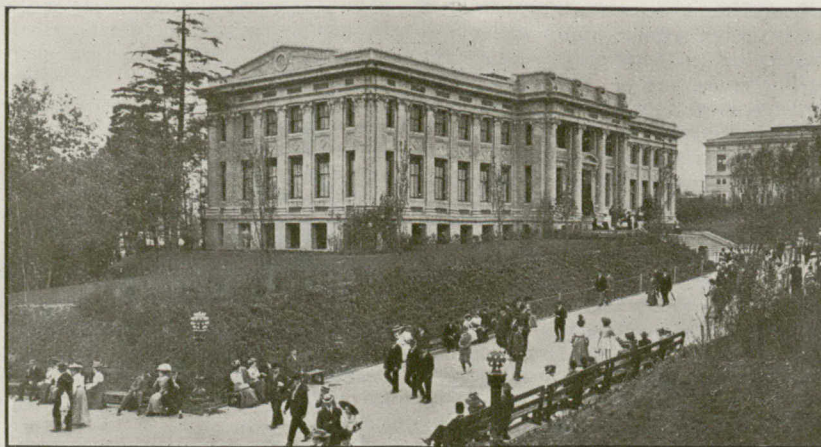
Its hairy body and legs, and the peculiar softness of its greyish-white wings streaked with black, give it a handsome appearance as it rests upon the bark until nightfall, when it will take to its wings and find a mate.

The meaning of the wavy markings upon its wings is a problem that remains to be solved. These, doubtless, have some significance amidst its surroundings, and although the moth is conspicuous to us as it appears upon the bark, it may not be so to the enemies that attack it at this stage of its development. On the other hand, it may be more conspicuous to them than it is to us, and its bold display may be a warning to birds and other insectivorous

turn of mind. With the optimistic outlook which a comprehensive grasp of these possibilities produces in the mind of the prospective fruit grower, the beginner may be disposed to overlook some of the dangers which more extensive observation and experience would teach him to guard against.

Not the least of these dangers is the tendency of many new arrivals, particularly those from the prairie country, to get too much land and plant too large an orchard.

It has been demonstrated beyond the shadow of a doubt that, in proportion to the amount of capital invested and the necessary operating expenses, much larger profits are obtained by the ten-acre fruit grower than by those cultivating from fifty to one hundred acres. We are safe in concluding, therefore, that the success of the fruit growers of this province, as well as other lines of business dependent for revenue therefrom, will be established permanently through the adoption of the policy of numerous small holdings operated inde-



FINE ARTS BUILDING, A-Y-P. EXPOSITION.

foes that it is unpleasant to the taste; for there are many British moths of a white and greyish color streaked with black and brown that rest with exposed wings upon the dark-colored bark of trees.

The moth is found in most parts of the British Isles, and this feature shows how far the extraordinary developments in its caterpillar stage have proved successful; for it does not follow that a highly-evolved insect is necessarily successful in the struggle for existence. Such developments only show how keen has been its struggle, and to what devices it has been driven to hold a place for itself—sometimes a place that it may be hourly losing.

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BE MODEST.

The possibilities of the fruit industry in British Columbia is a subject which has been much discussed of late and one which is constantly presenting new fields for the scribe with a horticultural

pendently, with the owners in each district co-operating together in the marketing of their products and for the purchase of the necessary supplies such as packages, spraying materials, fertilizers, implements, etc.

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DWARF VS. STANDARD TREES.

What is the comparative value of dwarf apple and pear trees and standard trees of the same varieties, for commercial planting?—D. P. S., Covington, Ky.

Unless land were very scarce we should prefer standard trees, except perhaps some varieties of pears which are said to do better as dwarfs than as standards. Dwarf trees are generally recommended for small gardens and for sections where San Jose scale is very plentiful, making it necessary to spray persistently. Of course the smaller trees can be sprayed more easily and more effectively than the large trees. Otherwise we can see no advantage in planting them.—The Fruit Grower,