

ON BUTTERFLIES AND GRUBWORMS

I am acutely aware of the danger that lies both in intellectualizing and in the extended use of analogies, especially in matters of the spirit. Analogies in particular are extremely valuable and incredibly dangerous at any time, for the more valuable one is, the more dangerous it becomes. The temptation to twist reality to fit various aspects of one's analogy become almost irresistible. However, I have finally decided this particular risk is worth it.

In this regard, the substitution of "grubworm" for "caterpillar" is, on second reflection, very shrewd on two counts. It connotes greater ugliness (it calls to mind the June-beetle grubs I used to dig up in the yard for fish bait), and it dramatically exposes the analogy for what it is--an analogy.

There are other aspects of insect metamorphosis (the verb form, by the way, is metamorphose, not "metamorphosize") that may be helpful. I am going to take a further liberty and use moths because their final form is more helpful as will be seen. The description I am giving is straight, "textbook biology" which I believe will, in our context, become transparent.

From the moment a caterpillar hatches from an egg, its entire life is devoted to one thing: finding and consuming as much food as possible as rapidly as possible. If you have never closely watched a caterpillar eating a leaf, you cannot fully appreciate that statement. It is awesome. It grows very rapidly and there are three major events in its life. The first two are molting, or the shedding of its entire outer covering. It emerges from each molt a slightly more complex and efficient food-getter than before (i.e., it adds some body parts), but it is still a caterpillar. Its entire life has to do with feeding itself and growing larger.

Scattered through the body of the caterpillar from the time it emerged from the egg are little patches of cells that play no part in the life of the caterpillar. They grow slowly and in a pattern different from the growth of the caterpillar and so are "easily" identified. They are called imaginal discs (honest!).

Finally comes the third major event in the caterpillar's life. It stops feeding and begins to produce silk thread through a pair of special glands. It weaves with that silk a dense cocoon that completely surrounds itself. Then a most remarkable thing happens. The caterpillar dies! I don't mean it is transformed. I mean it dies a biological death-dead.

Then the cells of the imaginal discs begin to divide and grow, using the body of the dead caterpillar for materials and energy. They continue to grow and differentiate into various kinds of tissues until the various discs have fused together and completed the development of --a moth. By that time the caterpillars' remains have been used up.

The moth then emerges from the cocoon, straightens its wrinkled wings and is the essence of freedom. It can fly to other places, see new things--and is utterly doomed. For the moth has no digestive system at all! The moth has just one function--to find another similar moth of the other sex in

order to mate and leave the next generation. This they are extremely well-equipped to do. A male can "smell" a female of the same species as much as two miles away in a gentle breeze. So the moth is beautiful, "free", and soon to die; with just one reason for being--to ensure the future of the species.

The radical shift from caterpillar to moth is so radical that the word "adult" is meaningless when applied to metamorphosing insects, and is never used. The term for the moth form (or fly, beetle, etc.) is imago (hence the "imaginal" discs).

----Jim Jewell