



***The Molyneux Problem***

16.5 × 23.5 cm, 144 pages, 2012



I.  
*Ubx expression*

My first drawing professor still laughs at me when he remembers how, at the beginning of his course in art school, I asked for extra drawing exercises because I felt the assigned task was too hard to accomplish. The task was to draw a paprika. He still wonders what I saw in that paprika that scared me so much. And yes, there is something in the universe of the paprika that still impels me to draw; observe; think. The paprika itself—its complexity, the folds, the ways in which the light is reflected or absorbed by its surface—is a universe of possibilities.


*Ubx expression* was a project carried out in the collection of the Entomological Museum, at the University of Amsterdam. I sat in the collection for a number of months, drawing butterfly wing patterns. The outcome of the project consisted of 120 drawings of 8 x 8 cm, pen on cardboard.

My point of departure was that most of what we find in collections of natural science and history; are schemas of how samples look in nature, with a single pattern that is supposed to identify the patterns of all butterflies, zebras, tigers, shells, fossils, etc., whereas in reality, if we look at countless numbers of, say, butterflies, we would find endless numbers of variation in these individual patterns as well.

*Ubx expression* is a term that refers to a form of chemical expression; the *Ubx* protein affects the ways in which insect wing patterns are organized, and is related to the variability of these patterns. It functions as a transcription factor and regulates detailed aspects of scale morphology, pigmentation and eye spot patterns in the hind wings of butterflies.

The rule of differentiation is shared by all living and non-living organisms, but in the case of moths and butterflies, the differences crystallize in colour and forms. Unique in moth and butterfly species, is that the elements in the overall pattern are individuated: unlike the spots and stripes of vertebrate colour patterns, the elements of butterfly wing patterns have identities that can be traced from species to species, and typically across genera and families. Because of this identity, or blueprint, it is possible to recognize homologies among pattern elements, and to study their evolution and diversification. During evolution, this blueprint is re-arranged in novel ways to produce species-specific patterns. It requires a trained eye to see that a pattern undergoes different variations and permutations, over the course of thousands of years. In the evolutionary line, sometimes spots reappear as spots, and sometimes they expand, transforming into a stain. In other cases, they merge together and become a line.

Kopelman described five projects dealing intensively with research, traveling, observing, and drawing. Her descriptions and work notes give insight in Kopelman's relation to science and point at the distinction between what one knows and what one sees. More than showing results she shares a mental process

evolving in every project. The text has been adapted from her doctoral dissertation, defended in September 2011. Text edited by Moosje Goossen. Design: Roger Willems. Published by Roma Publications. [Order here](#) 

I. UBX EXPRESSION

and approach. For me, it connects several of the discussed threads together in a meaningful way:

'Several of your projects testify to the 'resistance' of the world against our trying to get to know it (the Antarctic, the desert). Here is an important similarity with doing science of course: scientists are working hard to overcome such resistance all the time. I include what I think is a beautiful example: a scientist trying to repeat an historical experiment done by James Joule in the nineteenth century. 'Getting to know' means overcoming such resistance. In your case, you get to know an object by drawing it (which is like 'observing with your hands without touching') and you can't do that when you can't draw due to the instability of your position or of the object.'

This is where understanding becomes mutual.





